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Walkability and the aging population: A best practice manual for small community

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Chapter - 1. Introduction

Iowa's aged population mimics the national trend. The State Data Center predicts the population of those 65 year and older will grow from 491,349 (estimated in 2015) to 683,251 by 2050 (Davidson, 2017). This suggests that there is growing concern for providing amenities to those aged population of 65+. This study targets small cities/towns in Iowa to understand and counter the problem of growing old age population. It is expected that current planning strategies needs to be changed in accordance with the rising concerns about the built environment and increasing in numbers of elderly population. In addition to this, resource allocation will be a key factor as cities attempt to provide accessibility to amenities and services. To address this challenge, the study focuses on the concept of walkability to suggest urban planning and design ideas to assist cities to accommodate an aging population.

Good street design, access to public transport and diverse retail outlets may encourage individuals to remain engaged with their local community and maintain supportive social networks. (Beard, 2010) In order to understand the perspective, the study looks at 13 small towns in Iowa which are classified based on the median age, population size, area and walk score. The research is further narrowed down to one town which will have detail analysis in terms of density, walkability and land use which will be the basis of the study. The goal is to try and initiate alternative design/ planning strategies to counter the problem of aging by developing a best practice manual for the towns. However, this manual will also focus on alarming issues in the rural communities like housing, healthcare and walkability. All these three aspects are very much dependent on one another. Housing affordability is one of the major issues that is being

faced by people in both urban and rural areas. For the very reason, this research focuses more on Housing as far as smaller communities are concerned. While the cost of housing in rural communities is lower, income in rural areas is also lower due to fewer economic opportunities for rural citizens, and the fact that traditionally rural industries are struggling. Additionally, the poverty rate in rural areas is higher than in metropolitan areas. One of the largest issues that is facing people living in rural communities is the maintenance of their homes. (Geffe, 2018)

Apart from affordability, the Housing Assistance Council notes that population loss in some rural areas, particularly in the Midwest and parts of Appalachia, contributes to increased vacancy, deterioration of the housing stock, and declining home values that make securing loans for rehabilitation and modifications more difficult. (Levitt, 2017). Issue of population shrinking in turn affects the livability of a community, security in a community, economic instability and result in no growth of the community. By merging both urban design and planning solutions to counter the problem will be more efficient way to address the challenge associated with an aging population. Elaborating the issue of housing in rural towns will automatically solve problems of social isolation, sprawl, safety, health and accessibility for people in the community. This will not only help to access the problem of ageing population but the entire community. In sum, I can say that this practice manual could be of prime importance for rural towns who are facing and will be facing issues of aging population.

Major focus of this research paper is directed to accommodate needs of aging population. However, the major cities are equipped with lots of facilities that are targeted specifically for the aging communities like health centers, gated communities, nursing assistance, accessibility in

public transit options that is likely to assist aging population but the vulnerability rises when we see the rural towns or small towns. As most of the rural or small towns are dependent on neighboring major cities for their resources. Also, the smaller towns do not have adequate physical and economical infrastructure to help the aging population in their vicinity. This paper will be a guide for these small rural communities and will elaborate on how these communities can be self-sufficient or address the needs of aging population in the best possible manner.

1.1 Why small cities?

When we are working to counter urban problems, scale becomes an important criterion that will help to get successful outcomes. Possessing urban problems can be a part of both a smaller city that caters to few hundred people and a major city that caters millions of people. In order to develop an efficient solution to urban problems, it should be tested on a smaller scale before it is implemented on a bigger scale. As I believe that testing solutions to urban problems in smaller cities will be easier than to test this at a larger audience. In addition to this, ageing population is facing a lot of issues within small towns. The major reason being the disproportionate share of people and the lack of resources like access to public transportation service to commute within states, better healthcare facilities, entertainment facilities and access to fresh fruits and vegetables. And for this very reason I believe that the smaller cities should be designed in more adaptable way. Some of the major problems small cities face as far as an ageing population is concerned includes transportation, isolation, safety and accessibility to various facilities like transportation, healthcare, grocery and entertainment options. Isolation has a negative impact on health so tackling that is important. (Grahame, 2016). However, in some way I feel that these small cities are highly dependent on other major neighboring cities for their resources. On the

other end the increasing trend of aging population is a big concern in small cities and to assist the needs of aging population flexible regulations, recommendations should be made in planning.

1.2 Current Issues

Ageing population is not a problem that has one desired solution, but instead requires a framework that helps in improving various urban problems. With ageing population, some of the major problems to consider are health, accessibility to facilities, adequate housing, transportation, civic engagement and isolation. In addition, the increased cost of healthcare, land and non-availability of any kind of assistance makes it very difficult for an ageing population to live a better life. The only option available is to go for assisted living which is very expensive and is not core solution for the problem.

Population ageing is a global phenomenon with major implications for cities. Member countries of Organization for Economic Co-operation and Development (OECD) suggests that, the population share of those over 65 years old reached 17.8% in 2010 and is expected to climb to 25.1% in 2050. (Ageing in cities, Policy highlights)

Figure 1. **Older people (over 65 years old) as a % of total population**

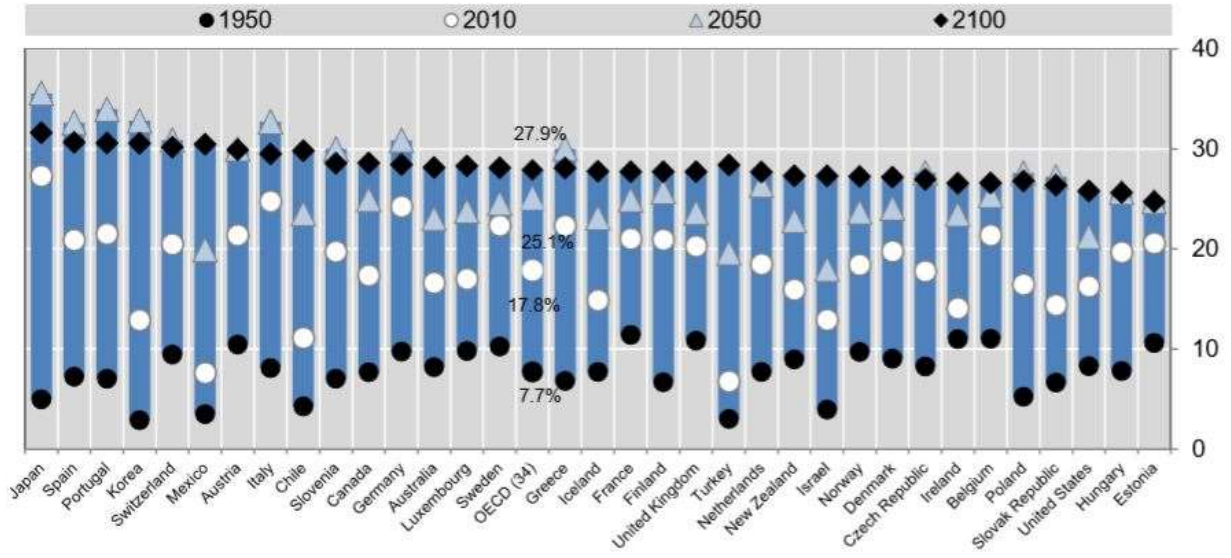

Figure – 1.2.1 *The figure above illustrates statistical data regarding presence of older people over 65 years of age around different parts of the world and also indicates how these countries will be dealing with health care costs. Source:* OECD calculations based on United Nations Department of Economic and Social Affairs, Population Division (2010), *World Population Prospects: The 2010 Revision*, United Nations, New York, available online: http://esa.un.org/unpd/wpp/unpp/panel indicators.htm.

The anticipated growth in the aging population will result in an expected 25 percent rise in health care costs by 2030. This can be witnessed from figure 1.2.1, as the figure elaborates numbers for the organization for economic co-operation and development (OECD) and the countries in the OECD organizations.

As the baby boomers turn 65 years of age, financing of their care will begin shifting from the private sector to publicly financed programs, including Medicaid and Medicare in the United States. (Keeping the aging population healthy) By 2025, most older adults will have spent their entire life getting around by a car and in many cases, will have chosen a home in a place where

the only viable transportation mode is the automobile (Lynott, 2009). After looking at several trends regarding the ageing population and the issues which are faced by ageing communities, all I can think of is to improve the environment in cities by making constructive suggestions and recommendations in planning. Recommendations will include both design interventions and policy-based interventions. These recommendations will also lead to changes in land use patterns and provide better connectivity. These ideas and strategies will not only help in finding solutions to the problem of ageing, but this will also help to make a city more vibrant and self-sustaining.

The figure 1.2.2 below compares United States, Netherlands and Germany as far as choice of walking and biking over other means of commuting. It is interesting to note that the figure for United States is the least indicating overdependence on vehicles, even if it is the older age population. This have had adverse effect on health and lifestyle of aging population as well.

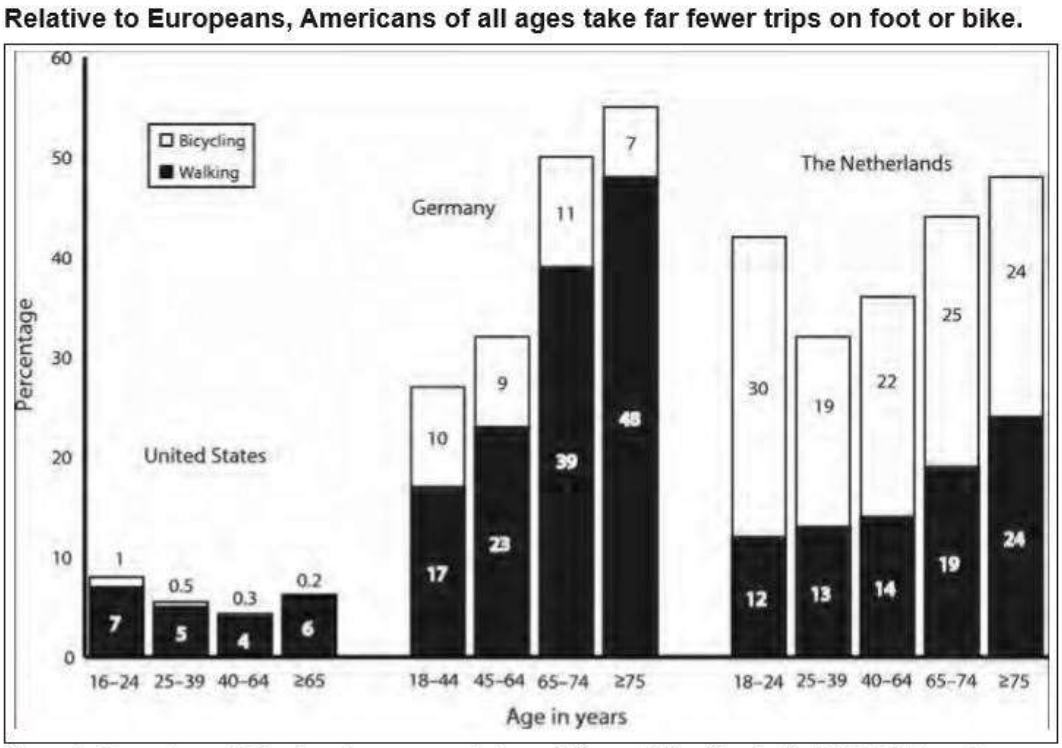

Figure 1. Percentage of trips in urban areas made by walking and bicycling in the United States, Germany, and The Netherlands, by age group, 1995

Figure – 1.2.2 *The figure above illustrates statistical data about percentage of trips in urban areas made by walking and bicycling in the United States, Germany and the Netherlands by age group.*
Source: J. Pucher and L. Dijkstra, "Promoting Safe Walking and Cycling to improve Public Health: Lessons from the Netherlands and Germany," American Journal of Public Health, *September 2003, Vol. 93, No. 9, pp.1509-16. Reprinted with permission from the American Public Health Associations.*

1.3 Why Aging Communities?

Many parts of the country especially counties in the rural Midwest are "aging in place" because disproportionate shares of young people have moved elsewhere (Mather, 2016). However, I believe that addressing walkability in these communities will empower social inclusion and improve the livability of the community. In addition to it, the growing concern of aging population possess risk like lack of security, lack of health facilities and care, higher cost of living, social exclusion, vulnerability to health diseases, accessibility to facilities and many more. These level of risk rises in the rural areas and small towns which are highly dependent on neighboring major cities. However, the aging communities have provided us a way where we can make considerable changes not only to the special needs of aging communities but to make the entire community more vibrant.

In order to make proposals for several planning and design strategies for cities, the best practice manual will be one of the key components for the cities. The best practice manual will include several design recommendations, planning regulations, strategic actions that will strengthen the cities. The idea behind developing a best practice manual is because improvisation is required in

various fields like improving connectivity, providing accessibility to facilities, promoting healthy environments and civic engagement in the cities.

Overall the paper portrays a process of understanding the current concerns in the planning field and why it is important to bring in new planning reforms, strategies and interventions to solve today's urban problems, strengthen social fabric and improve livability. The next section will broadly elaborate the major research questions identified for the research paper.

Chapter - 2. Research question

Research questions are developed keeping in mind the issue of rising aging population in rural towns of Iowa and the needs of aging population. Walkability is another important factor that is addressed, in order to solve urban problems. And the broader idea is to develop a practice manual that can be referred by planners for addressing the needs of aging population as rural towns as it is a concerning issue in United States. The following section addresses specific research question.

2.1 Research question

The research paper addresses two major research questions.

1. What is the role of walkability for an aging population in Iowa?
2. How can we develop a best practice manual that specifically accommodates the needs of ageing population in Iowa?

To my knowledge, targeting urban problems of smaller cities is vital as it provides a platform where we can test our best practices/recommendations to develop solutions to urban problems. And further these practices can be applied to any place.

The next section is going to elaborate on few terminologies that would elaborate more understanding about the research question in this paper.

2.2 Walkability

The term walkable has been in use since at least the 18th century (Oxford English Dictionary 2013). In contrast, walkability is a more recent terms rarely defined in dictionaries but in common use. (Forsyth, 2015) Walkability refers to an area that promotes walking and is a

measure of how friendly an area is to walk. However, the term walkability has several meanings. In many cases, an area that has the mere presence of sidewalks and mixed land uses is classified as being a walkable environment. (Spoon, 2005) Besides this walkability offers surprising benefits to our health, environment, finances and communities. In other words, walkability is one of the best solutions to fix problems for ageing population. All the concerns or issues for an aging population can be efficiently solved by improving walkability in a city. Improving walkability could be a great solution not only for ageing population but for people of all ages.

2.3 Aging Population

Aging population is defined as the population which experiences an increase in median age of a region due to declining fertility rates or rising life expectancy. In other words, the population which are aged 60 or above is classified as ageing population. Population aging is poised to become one of the most significant social transformations of the twenty-first century, with implications for nearly all sectors of society, including labor and financial markets, the demand for goods and services, such as housing, transportation and social protection, as well as family structures and intergenerational ties (United Nations, 2017).

The aging of the world's populations is the result of the continued decline in fertility rates and increased life expectancy. This demographic change has resulted in increasing numbers and proportions of people who are over 60 years of age. As a result, the first time in history when there will be more older people than younger people are rapidly approaching. (WHO, 2010)

Aging should not be considered as an issue but an opportunity to make the place better for people to live. With shifts in different aspects of planning including transportation, housing, accessibility to resources and healthcare provides us a great platform to reenergize, revitalize and

recreate neighborhoods in cities. By developing a walkable environment for people in the city that will boost the health and lifestyle of people. However, I believe advantage of having aging population in a community can be taken to improve the livability of a place and strengthen the social structure of the place by accommodating the needs of aging population in terms of both physical and social infrastructure.

2.4 Best practice manual

A best practice manual is like a guide or a handbook of rules, regulations, recommendations, strategies and design interventions that can improve a community/city. The best practice manual ensures that the city can become vibrant and independent. But in course of this research paper the best practice manual that will be developed, will be more focused on issues of an ageing population in small towns in Iowa. And aging populations should be considered as an opportunity to make the town more sustainable, walkable and connected both physically and socially. Considerations in zoning regulations, changes in the development pattern, flexible urban design interventions can contribute to achieving immediate and long-term goals of the town and policy-based recommendations will also be a part of this manual. The manual will be mainly focusing on issues of housing, healthcare and walkability in small towns. As I believe that addressing these three aspects for community will make a great positive impact on the community. Especially when we are working to counter problems of aging population, addressing better housing principles, pedestrian infrastructure and easy access to healthcare center will solve majority of problems faced by aging population. This manual will be a reference for any smaller city with ageing population, so that they can follow the planning strategies, interventions and recommendations to address the urban problems with respect to an

aging population. This manual is not only going to solve the problems of ageing population but will make the place more self-sustainable both in terms of physical structure and environment that can benefit people of all ages.

2.5 Needs for aging population

As the population ages, there are certain sets of requirements that increases. The basic needs like accessibilities to medical facilities, transportations nodes, grocery stores, community centers and better housing facilities. In addition, providing a safe and healthy environment are two key crucial needs so that the aging population can contribute to better quality of life and make small towns independent as far as resources are concerned. Provision of these needs will not only help an aging population but also strengthen and improve livability in a city.

Figure – 2.5.1 *The figure above showcases a schematic diagram about aging community.*

Source: Author, 2019

The figure 2.5.1 above clearly describes the needs of an aging population and what are different sectors that support the needs of an aging population. Making development in sectors like housing, transportation, health and accessibility will make impact on existing land uses, zoning considerations of a place and changing the development pattern. But having flexibility within planning regulations will be a key to addressing the needs of an aging population. Improving these sectors will also improve livability of an area and will result in all around development of a place.

In the following section, the methods to answer the research questions will be discussed. The following section will provide understanding about how data from various sources will be utilized in order to answer the research question.

Chapter - 3. Methodology

To address the research questions identified, quantitative analysis will be utilized. Quantitative methods emphasize objective measurements and the statistical or numerical analysis of data collected through polls, questionnaires and surveys. US census data, American Community survey data and other secondary sources will be helpful to understand the demographic information of the towns in Iowa. In addition to it, spatial data analysis and mapping analysis using GIS software will be part of my methodology. Apart from this I am even planning to use descriptive data source for developing a population pyramid. The next section will provide insight about the study area that is focused for the research.

3.1 Study area

Aging population is one of the major issues in United States, especially in the rural towns of Midwest. The focus of my research was to look at small towns in Iowa. Iowa was selected as the study region because it had a population of 514,215 aged 65 years and older which accounted for 16.4 % of the total population in the state. In 2016 Iowa ranked 16th in the percentage of population age 65 and older. This statistic clearly suggests that in the coming years the trend of aging population is likely to grow. It is estimated that by 2050, about 20 % of the population in Iowa would be classified as elderly population. This can be witnessed through below figure 3.1.1.

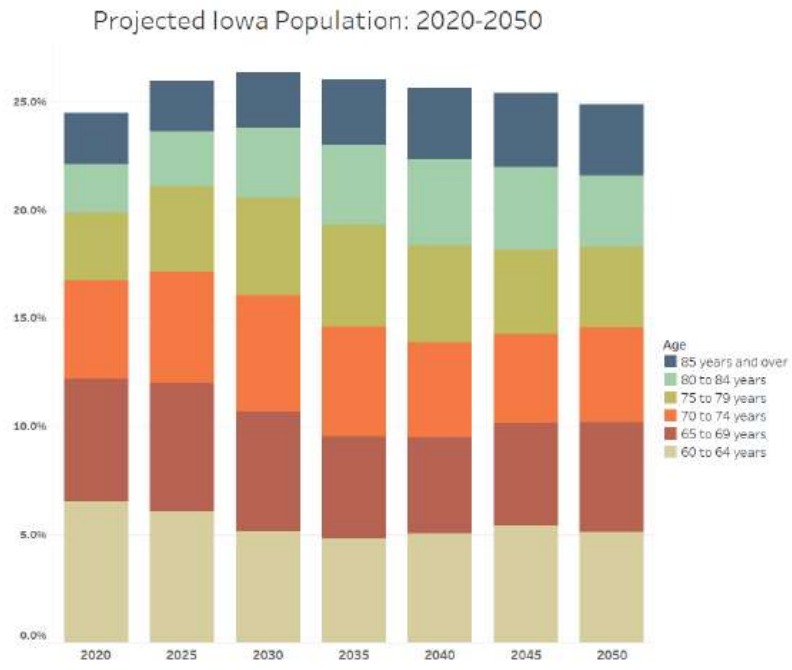

Figure – 3.1.1 *The figure above presents a bar graph projecting population of Iowa from year 2020 – 2050 highlighting different age groups.*

Source: Older Iowans: 2019, State Data center of Iowa and the Iowa department on Aging, *May – 2019, Retrieved from* [*https://www.iowadatacenter.org/Publications/older2019.pdf*](https://www.iowadatacenter.org/Publications/older2019.pdf)

In order to narrow down the research work, classification of the towns/cities in Iowa was done based upon their population, median age, walk score, bike score and the density of city. In total thirteen different towns/cities were identified.

The initial methodology upon which I started my classification was the median age factor. As the current median age of the entire country is 38 years and the towns, I looked upon in Iowa have median age more than 50 years. The median age in small towns of Iowa is way greater than the national average. And because the research is focus on needs of aging population, small towns in Iowa would be a great way to study and develop a base of my research study. The other classification was to define towns by their population size of less than 1000 people. The main

reason for going for a small town is because the implications both in terms of planning and design could be implemented easily as compared to bigger cities. Also, the problem of more elderly population living in such small towns are more vulnerable to issue such as safety, health and lack of accessibility to resources. This also suggests that social security and Medicare expenditures are likely to be impacted. The large share of elderly also means that social security and Medicare expenditure will increase from a combined 8% of GDP today to 12% by 2050. (Mather, 2016) However by studying smaller towns with a larger concentration of ageing population will help to examine the challenges faced by ageing population.

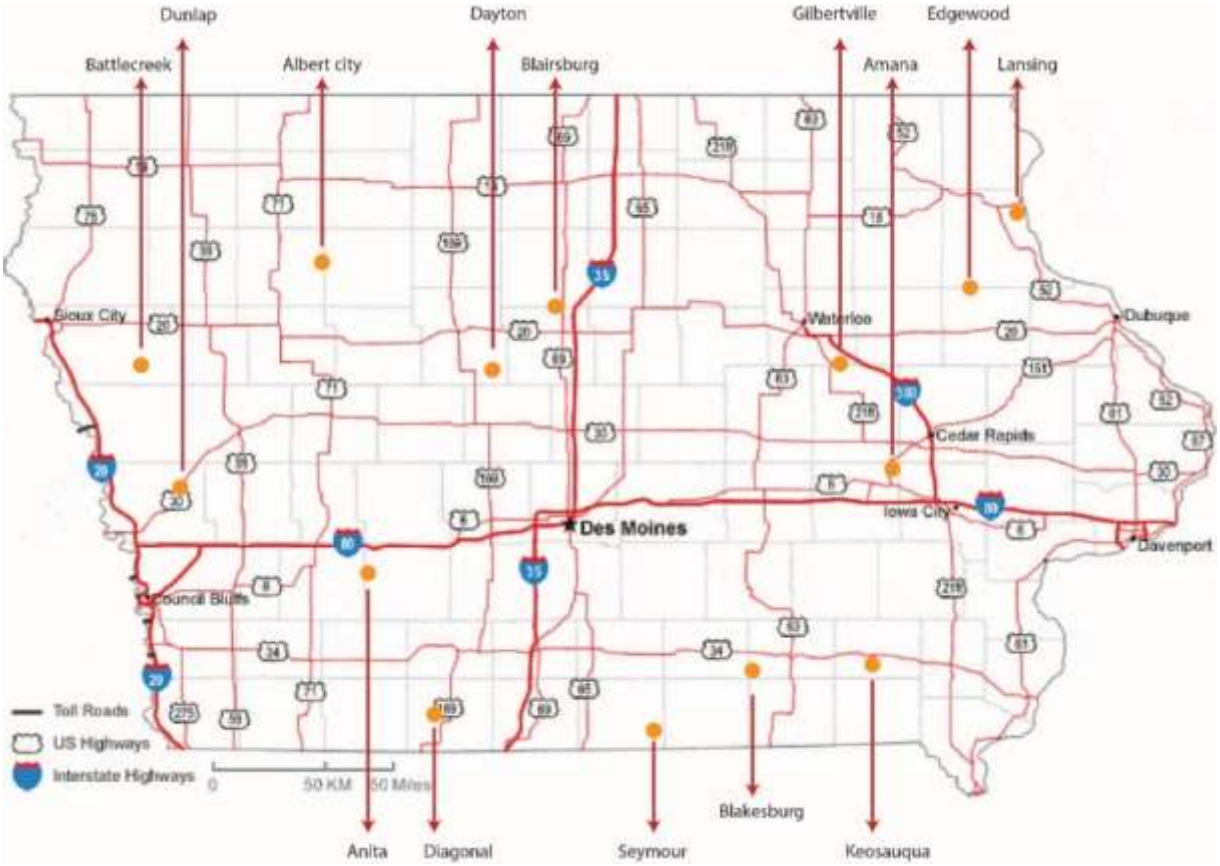

Figure – 3.1.2 *The figure above highlights the location of thirteen small cities in Iowa State.*

Source: Author, 2019

Figure 3.1.2 highlights thirteen small cities in the State of Iowa which have higher median age in comparison to the national average. Elaborating further, several other parameters like Population, walk score, Bike score and Population density of the town were used to identify the thirteen towns in Iowa. Adding another layer of population pyramid was very necessary to understand the community in all the thirteen towns. The descriptive chart is as follows

Table – 3.1.1 *The table below is a comparative table of identified thirteen small cities in Iowa in respect to median age, population, walk score, bike score and population density factors.*

Name	Median Age	Population	Walk score	Bike score	Population Density
Amana	51.8	442	35	45	392 ppl/ sq mile
Albert city	49.1	678	24	Car dependent	1244.64 ppl/ sq mile
Anita	50	926	47	Car dependent	1244.64 ppl/ sq mile
Battle creek	50.6	690	7	33	1384.09 ppl/ sq mile
Blairsburg	50.3	206	4	Car dependent	319.16 ppl/ sq mile
Blakesburg	52.7	288	3	Car dependent	1071.88 ppl/ sq mile

Dayton	52.1	798	49	Car dependent	942.98 ppl/ sq mile
Diagonal	55.2	319	21	25	358.44 ppl/ sq mile
Dunlap	51	971	45	40	859.99 ppl/ sq mile
Edgewood	50.8	865	46	Car dependent	1017.70 ppl/ sq mile
Gilbertville	51.4	735	26	Car dependent	1845.42 ppl/ sq mile
Keosauqua	52.6	923	34	Car dependent	638.08 ppl/ sq mile
Lansing	54.3	941	56	46	874.10 ppl/ sq mile

The above comparative table 3.1.1 is formulated by keeping in mind factors like median age, population size, walk score, bike score and population density. The table compares thirteen small cities in Iowa based on the above listed factors. Initially three different cities with different population size and high median age factor were selected. The chosen towns were Diagonal, Lansing and Gilbertville. The major reason to reduce my research to one town of Lansing is because of non-availability of data for the communities of Diagonal and Gilbertville. The major reason for not having data was that these three communities are independent communities and for which they are neither supported by state or federal government Further, Lansing city in Iowa was selected for further research and analysis. The major reason to choose the city of Lansing is the highest median age, population mark just under 1000 people and the place has two big assets i.e. bike ability and walkability in the city which could be a great base to study the place. City of

Lansing could also be a great case study as the bigger goal of my research was to create a best practice manual for small towns in terms of aging population.

3.2 Methodology in respond to research question

To answer the two-research question, following methodology will be used.

Research question 1

What is the role of walkability for an aging population in Iowa?

Walkability is one of the excellent shorthand for good urban design. Pedestrian-friendly environments that encourage regular local walking may be important from not only a physical but also a mental health perspective. (Wood, 2010) Ensuring walkability in an area not only accounts for relationship between built and open environment but also strengthens the social environment. Denser, more walkable urban environments have also been said to spur more social interactions of the sort that encourage creativity, as well as higher levels of civic engagement.

As people age, they may lose the ability to drive safely long before they lose the ability to walk. Walking is the favored mode transportation for seniors who are either uncomfortable driving or unable to do so. Walking helps maintain health and important social interactions. Providing safe sidewalks and dependable public transit for older adults can reduce the overall cost of personal services (M. Scott ball, 2016). This clearly suggests that by bringing walkability into the small towns could result in a wide variety of benefits especially for the elderly population. In order to achieve this, I started determining an evaluation method for measuring walkability. I believe walk score, Bike score, population density are three great parameters to understand the walkability of a place. These parameters are used in the above listed chart, as it was one of the criteria to short list the towns for detailed study. So, based upon the data from the thirteen towns,

I chose city of Lansing as my case study. The main reason to choose the city of Lansing was because its posses' assets like walkability and bike-ability which makes assessment of community easier.

In addition to this accessibility to resources, understanding land use, pattern of development and zoning code is also equally important to study as the walkability aspect in the town. However, these aspects require more detailed and in-depth study, which will be implemented further.

Research Question 2

How can we develop best practice manual that specifically accommodates the needs of aging population in Iowa?

From the previous question we determined the value of walkability to the ageing population, however in this case I am looking to develop planning actions for aging population by creating best practice manual for aging population. In order to create the best practice manual, several indicators for community aging like transportation, accessibility, housing, security, health and walkability will be the key aspects to consider. In addition, understanding the livability index of a place will also help in focusing research in the right direction. It is said that the future growth of the older population will necessitate a more integrated aging infrastructure, with increased housing, transportation, social service, and health care options that meet the needs of both active and frail older adults (Alley, 2007) I believe there are several approaches to create this manual. There are five major dimensions of the built environment which are determined for walking and walkability. They are known as the five Ds; "density, diversity (land use mix), design (including street connectivity), distance to transit, and destination accessibility" (Rafiemanzelat, 2016) The

five D approach will help to bring ideas for addressing the needs of aging population in the small towns of the Iowa. In order to implement the five D approach, several planning recommendations, strategies and interventions both in terms of policy and design are presented so that the community can be developed according to it. Planning regulations especially in case of housing, walkability and accessibility will be crucial part of shaping development in the best practice manual. The manual will also highlight several indicators that need to be targeted and improved as far as an aging population is concerned. The best practice manual will be a guide for planners in small cities so that they can improve the livability in an area for people of all ages in the community.

The next sections in this chapter will elaborate the basis for the detailed study of the small town. The section comprises of two key aspects that will guide the research work so that the research questions can be answered efficiently.

3.3 Livability index

Livability index is a signature initiative of the Public Policy Institute to measure the quality of life in American communities across multiple dimensions. The Public Policy Institute promotes the development of sound, creative policies to address the common need for economic security, health care, and quality of life.

AARP (American Association of Retired Persons) Network of Age-Friendly States and Communities helps cities, towns, and states prepare for the rapid aging of the U.S. population. Many residents and officials in these communities and beyond use the Public Policy Institute's Livability Index, which scores towns and cities throughout the nation based upon the services and amenities that impact people's life the most. This tool can help people find well-

designed, livable communities that promote healthy and sustained economic growth, making for happier, healthier residents of all ages.

Livability index score is based upon seven different categories:

- Housing
- Neighbourhood
- Transportation
- Employment
- Health
- Engagement
- Opportunity

The figure 3.3.1 below includes the livability index for the community of Lansing in the state of Iowa. The information presented in the table contains specific scores in all different categories like housing, neighborhood, transportation, employment, health, engagement and opportunity upon which the livability index is based. Main idea to include the livability index here is to understand the community in an elaborative manner so that the regulations, recommendations made in terms of both planning and design are considered. At the same time studying this town with the livability index will help to developing areas in respect to planning that can be worked out in order to address aging population.

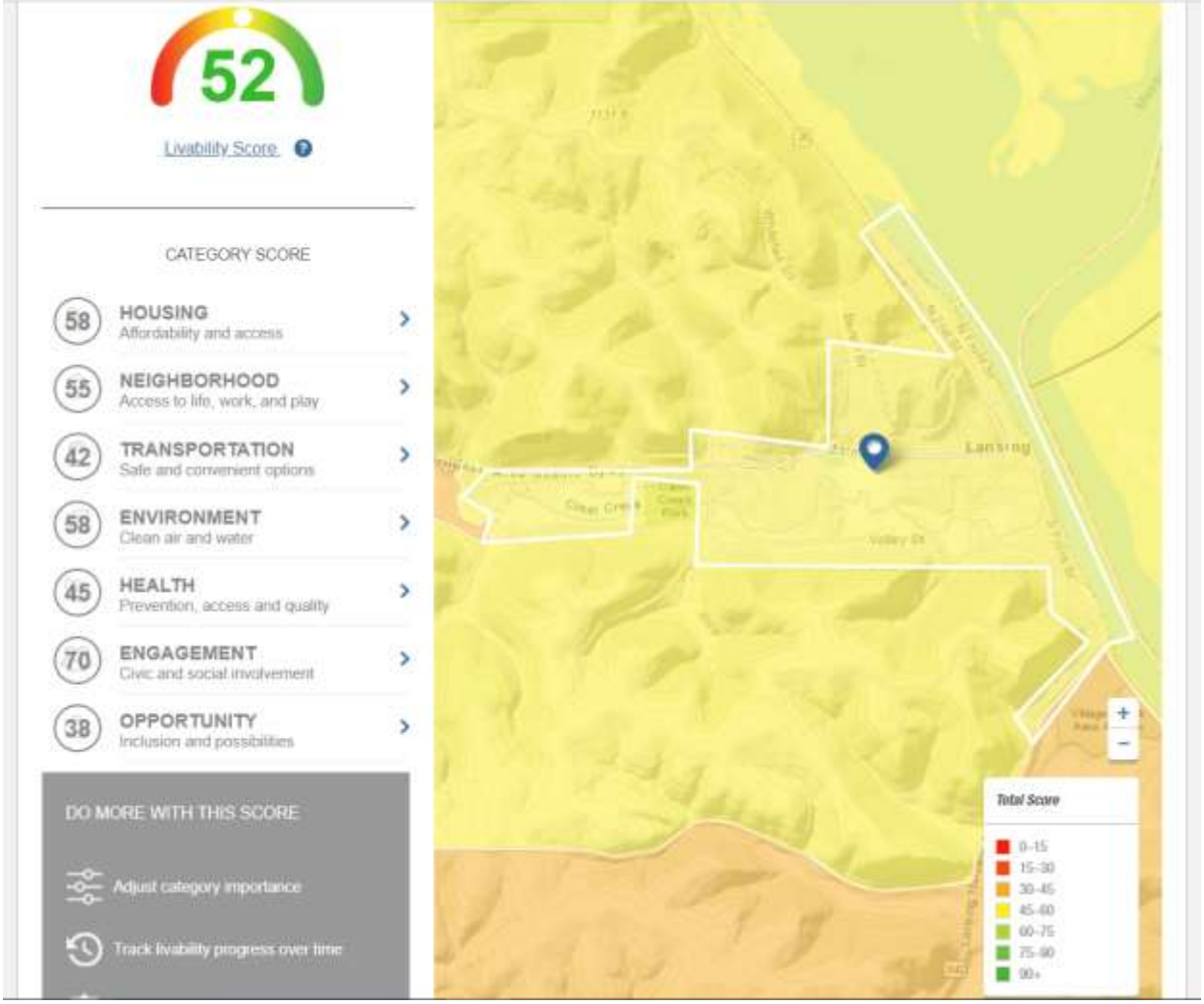

Figure – 3.3.1 *The figure above illustrates the livability index score for the city of Lansing in Iowa.*

Source: AARP Livability Index - Web-based Tool to Measure Community Livability. (2018). Retrieved from https://livabilityindex.aarp.org/how-are-livability-scores-determined

The above figure 3.3.1 presents the livability index score for the city of Lansing with elaborate score in different sections upon which the livability index is dependent. The livability index score rates the overall livability of the neighborhood, city, county or state on a scale from 0 to 100. The total livability score is based on the average of all seven category scores, which also ranges from 0 to 100. Communities are scored by comparing them to one another, so the average

community gets a score of 50, while above average communities score higher and below communities score lower. In this case, Lansing is listed just above the average town as far as livability is concerned.

Housing is a central component of livability and this category draws attention to the need for people of various levels of physical ability and income to find appropriate housing. The affordability and density of housing are other criteria that are looked upon for determining the score under Housing section. In the case of Lansing, the score is above average, and the major issue is the affordability. The next section of neighborhood focuses more on two things, i.e. access and convenience. In the case of Lansing the score is above average, and the issue is about proximities to parks and access to various facilities in the city. The other issue that Lansing faces is lack of density and vacancy in an area. The third section of transportation is all about providing convenient, healthy and low-cost alternatives for commuting. And the below score in the section of transportation indicates the lack of different means of commuting, especially in the case of public transportation services. Environment section monitors how healthy the environment is today by looking at air and water quality, as well as whether communities have taken steps for the future to improve energy efficiency and prepare resilience plans in the event of emergencies and natural disasters. In case of Lansing the problem lies in the water quality that is available to people in the community. The fifth section of health is all about maintaining healthy neighborhood and it looks upon the air and water quality as its primary indicators. Poverty rates, income group also has impact on the health of people. Also factors like provision of spaces for exercising within communities, access to health care facilities are also looked upon.

In the case of Lansing, the problem here lies with high obesity rate in the population, lack of means to exercise and access to health care facilities for which the score is below average.

However, the section of engagement shows a decent score. Engagement section looks from social engagement to civic action to Internet access, residents' individual opportunities to connect and feel welcomed help lessen social isolation and strengthen the greater community. The only problem in case of Lansing is the issues with internet facilities. The last section of opportunity focuses on how a community embraces diversity and offers opportunities to residents of all ages, incomes, and backgrounds is a strong indicator of overall livability. However, the score is low in case of Lansing because of lack of employment and educational opportunities. In addition to it, lack of age diversity is also clearly seen in the city of Lansing.

3.4 Community indicators for aging

Community indicators for an aging population are the indicators that suggests constructive areas where improvement is needed. Community indicators elaborate several classifications that showcases different demands in each category for ageing population. It also indicates that communities need to give more thought to the implications; identify community-specific needs, challenges and opportunities; and respond by adopting balanced planning strategies that address the needs and challenges, and realize the potential benefits, of an aging population. (Canada Mortgage and Housing Corporation. Policy and Research Division, 2008)

Six categories:

- Transportation options
    - Public transportation service

    - Age sensitive transit feature
- Access to services
    - Basic services like healthcare, grocery stores, retail shopping, community facilities, recreational opportunities.
    - Services to be located within short walk from residences
- Housing choice
    - Range of housing choices
    - Affordable housing
- Safety
    - Better lighting
    - Safer crossings
    - Encouraging more pedestrian activity
- Neighbourhood walkability
    - Condition of sidewalk
    - Specific routes
    - Solves problem of crime, facilitate community engagement, reduce feeling of isolation and promote active lifestyle.
- Community engagement in civic activities

The above mentioned are the community indicators that we can encounter in a community to solve the issues faced by aging population. The major problem today we are facing is because our planning strategies and regulations do not match the actual requirement by users in the community. However, I believe that involving community and its people throughout the planning process is a great way to make constructive planning reforms. Involvement of citizens will lead

to utilization of the resources available that meets the needs of aging population. And countering this community indicators will be helpful for the entire community and not only the aging population. Further in the next section of paper city of Lansing is analyzed as a case study to understand existing scenarios and trends in the community.

Chapter - 4. Analysis

The analysis section firstly includes the mapping analysis for city of Lansing. Further it includes the existing land use map of the city. The mapping analysis will help to understand the pattern of development in a community and at the same time communities can also be studied by their spatial organization.

4.1 Mapping Analysis

Map of Lansing city in Iowa is provided below. It highlights building footprints, parcels, green spaces, roads and water body as its main layers. However, it indicates spatial planning in the city of Lansing.

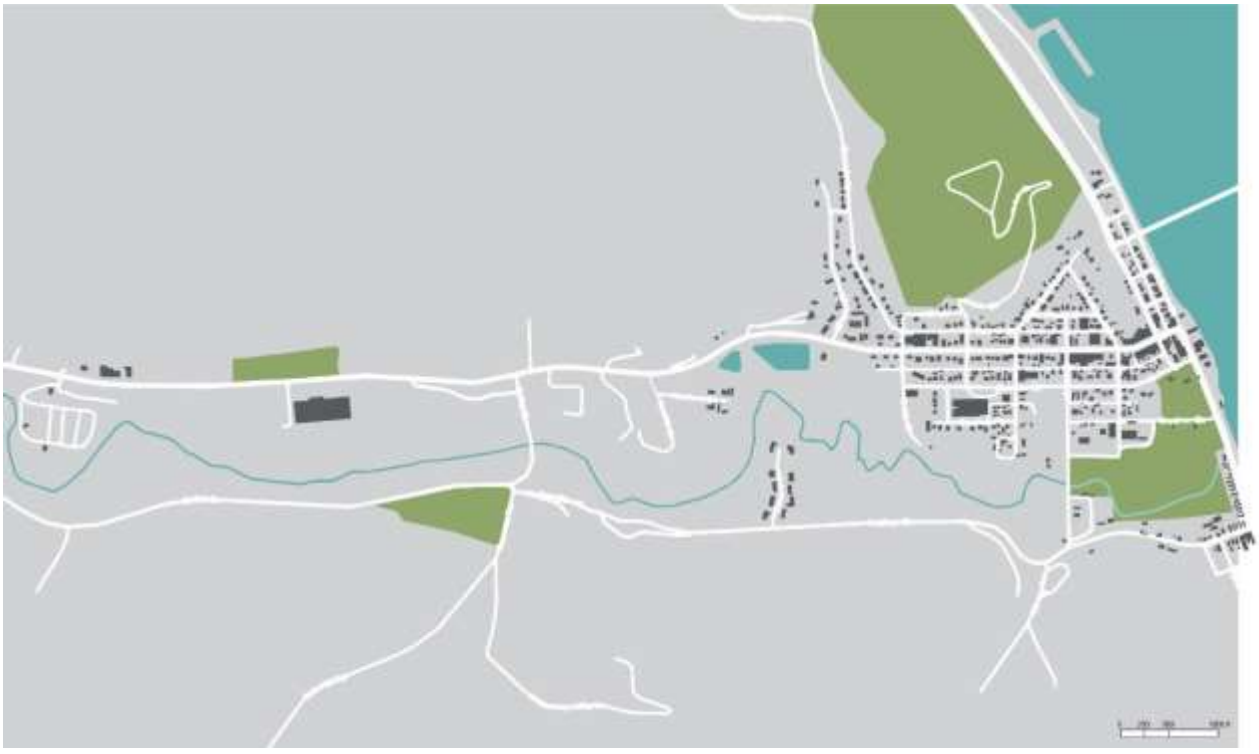

Figure – 4.1.1 *The figure above is the existing map of city of Lansing highlighting building footprint, greens spaces, roads and water bodies.*

Source: Author, 2019

The plan for city of Lansing presented in figure 4.1.1 also indicates a sprawling development pattern but the reason for spreading out development is because of natural topographical features of the place. However, map of Lansing does comprise of all the facilities that are required by the people of community to be self-sustainable both in terms of resources and infrastructure. And for the very reason implementing planning strategies and interventions would be handy as it won't require much funds for development. In addition, the median age of this small city is high in comparison to national standard. Lansing is also a very small independent community like both Diagonal and Gilbertville but does have existing land use map for the city. It becomes easy to understand the development of a place through its land use map. Analysis of Lansing will be further developed in detail as we can make planning recommendations, strategies and both policies based and design-based interventions to accommodate the aging population in this city. The detail analysis will include developments under every indicator that is to be responded as far as aging population is concerned. Below this is the map that indicates different facilities which are already present in the city of Lansing.

Figure – 4.1.2 *The figure above is the existing map of city of Lansing highlighting existing facilities in the city.*

Source: Author, 2019

The facilities map in the figure 4.1.2 clearly indicates that all the facilities are mainly located on the main street which is considered as a spine of development for the city of Lansing. It would be an appropriate case to study the town with its existing infrastructure and resources for aging population. And then to counter the problem of ageing population, necessary steps can be taken by planning body of Lansing. However, generalization of ideas, recommendations, planning regulations, policy-based interventions and design-based interventions will be produced in the best practice manual so that this can be referred by any small city which has increasing aging population.

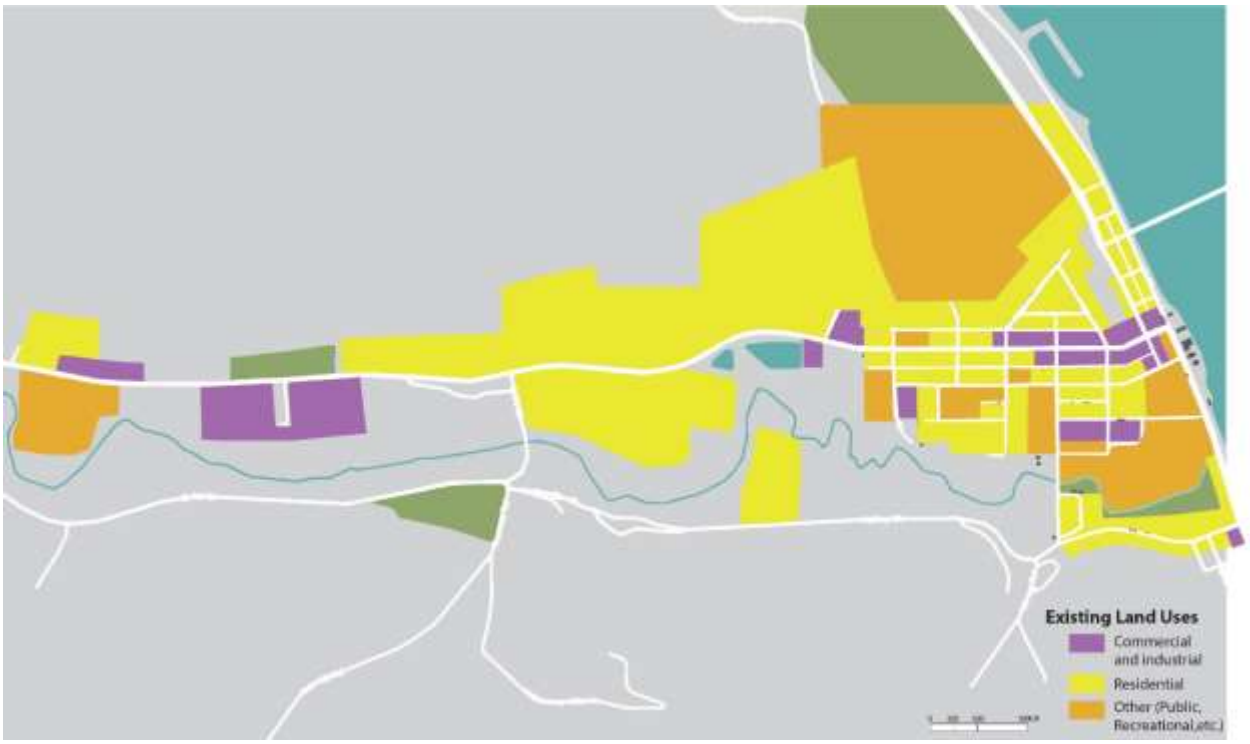

Figure – 4.1.3 *The figure above is the existing land use map of city of Lansing.*

Source: Author, 2019

The existing land use map of Lansing in figure 4.1.3 presents very few classifications of land use categories. This might be because the city is independent and not under any state or federal government. The classifications of three colors is in the form 1. Commercial and industrial uses which is highlighted in purple color. 2. Residential use is highlighted in yellow color and 3. Other category which includes public and recreational facilities in the city. However, this classification done is very broad, but it can be shaped into more detailed form.

Overall, from the mapping analysis we can infer the geographic conditions of a place, land uses and facilities present in the city of Lansing, which helps us to identification of areas where design interventions can be proposed. The land use map also indicates what diverse uses could be included or classified as far as future of the community is concerned. However, if we consider

the city of Lansing, we can generalize the ideas that we are proposing with a population of 1000 people in the community. Further in the paper, elaboration on planning/ design considerations will be portrayed to further develop idea about the community of Lansing. However, the arguments made can also be generalized for any small-town case.

Further in the paper, on elaborately understanding context and spatial information of the city of Lansing, a conclusion was derived about where can we add amenities or which places, we can make our constructive suggestions. The next diagram showcases what could be the possible spaces within city of Lansing where our recommendations can be made in different categories.

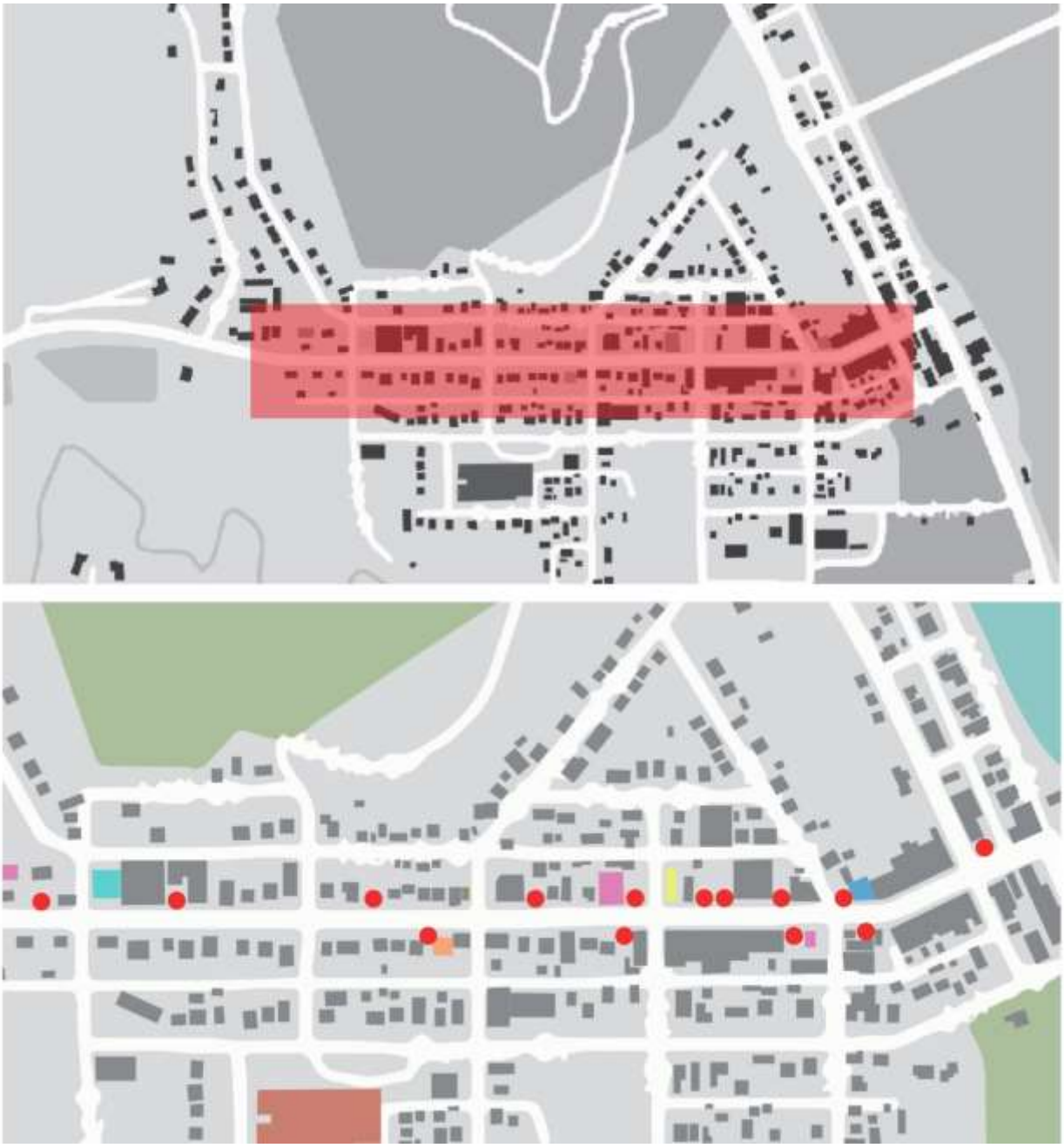

Figure – 4.1.4 *The figure above highlights the area in city of Lansing which have greater potential of development in the city.*

Source: Author, 2019

From the above figure 4.1.4, we can notice the spine of development which is the main street of Lansing. The highlighted area in red rectangular box is the section that is elaborated. The

elaborated or zoomed in map of Lansing with red dots showcases potential places for design interventions for the city of Lansing. The interventions mentioned in the figure 4.1.5 are the recommendations that can be added.

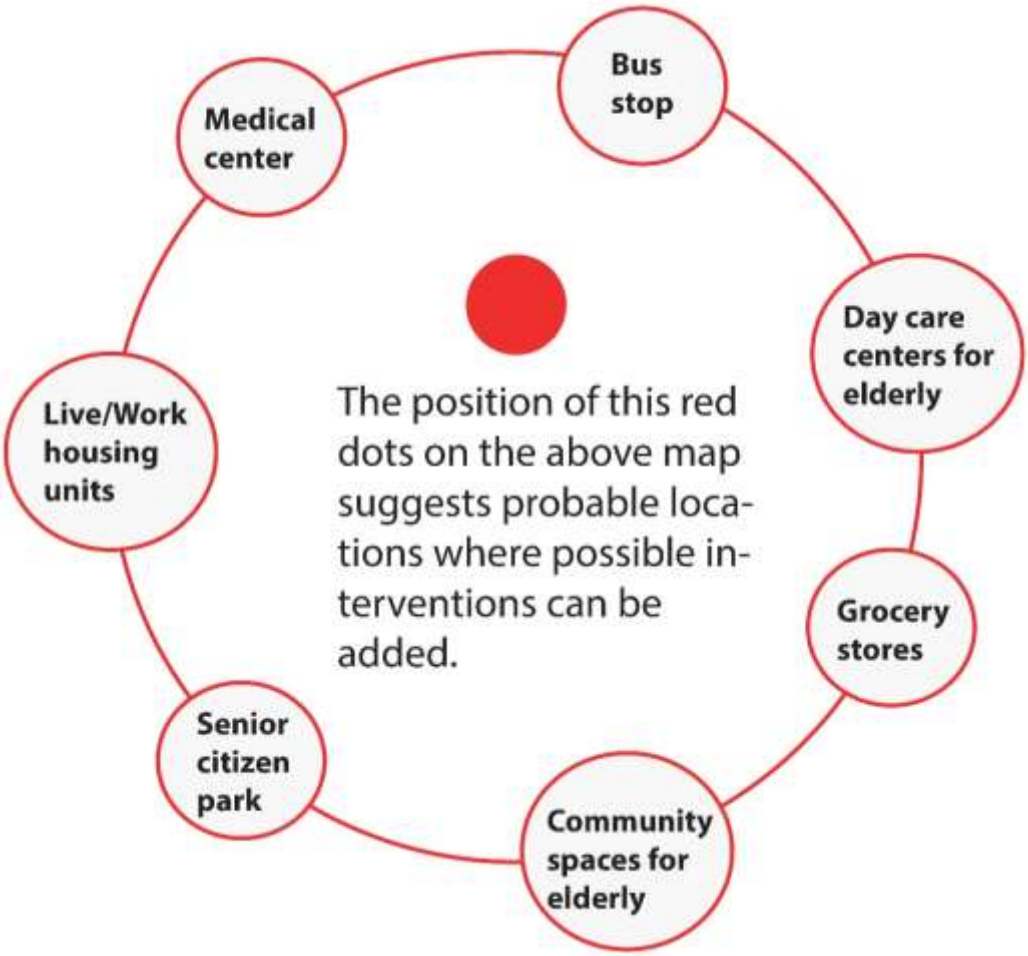

Figure – 4.1.5 *The figure above shows the potential uses that can be added to the figure 4.1.4 at the position of red dots for aging population in Lansing.*

Source: Author, 2019

The idea is to add amenities on the main spine of development. The next section will include looking to elaborate our ideas both with the case of Lansing city as well as general interpretation of small cities with increasing ageing population.

4.2 Planning/ Design Considerations

Both planning and design considerations are developed based upon the existing situations of city of Lansing and by understanding the demand of users which is indicated by population pyramid presented in Figure- 4.2.1. Considerations are made as per different sections so that it is easy to understand the details with respect to existing scenarios. However, this consideration will also respond to the livability index and will focus on community indicators of aging populations. Overall it will provide a glimpse of how the five D approach can be an important step to combat issues faced by aging population in smaller cities.

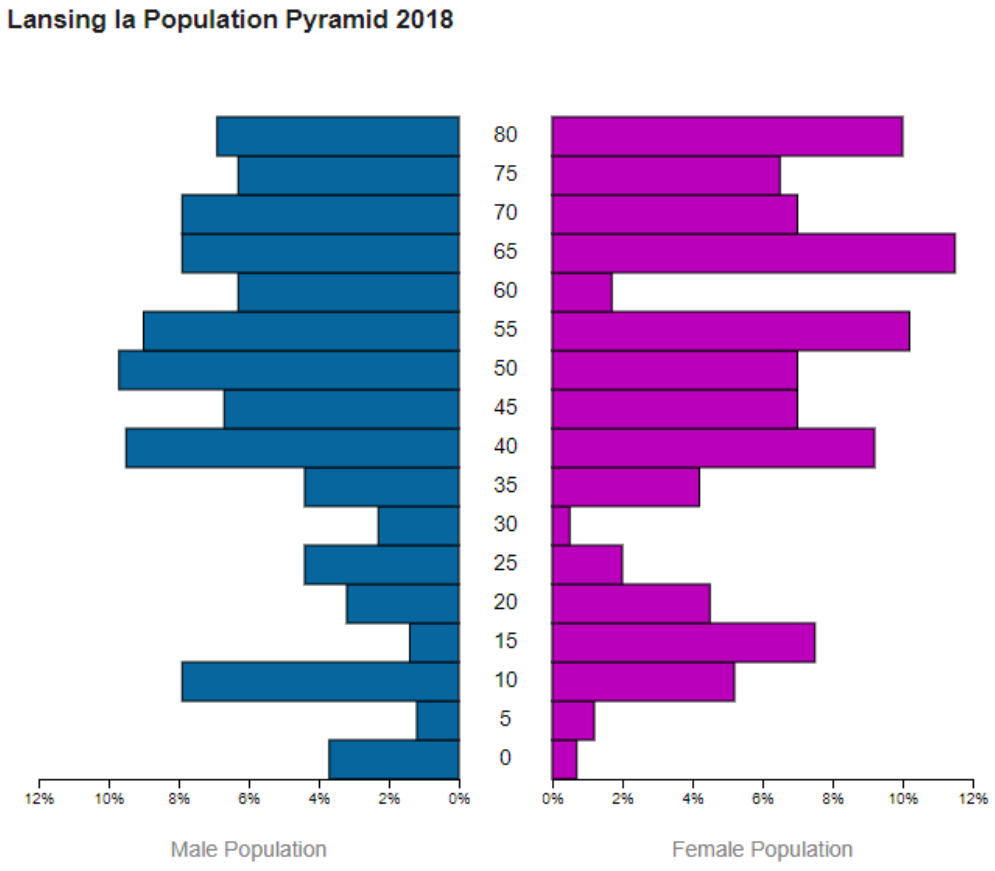

Figure – 4.2.1 *The figure above shows the population pyramid for the city of Lansing.*

Source: Data retrieved via US Census (2017 ACS 5-year survey) American city survey.

4.2.1 Housing

Housing is one of the important aspects upon which recommendations and strategies can be made. It comprises of 70 - 80 % of land use within the existing map of the city. It is important to understand the needs of the community before making any constructive suggestions in the housing sector. If we consider the case of aging population, the issue of isolation, weaker connections, security and disturbed social environment arises because of rules and regulations to incorporate housing in the community. Table 4.2.1.1 below indicates existing scenario of housing as far as city of Lansing is concerned. Making recommendations, constructive suggestions as far as layout of housing is concerned or by changing the development pattern in the neighborhood could really boost the life of people in the city. However, ensuring density of people per unit area and diversity of housing types will be key aspect that could help the aging communities.

Table – 4.2.1.1 *The table below showcases different means of housing available to people in city of Lansing*

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Types of Housing	**Existing presence**	**Possible interventions/improvisations**
Detached Single family Housing	Yes	Better facilities and proper amenities within the houses could really be appreciated by aging population
Multi-family Housing	Yes	Better facilities and proper amenities within the houses could

		really be appreciated by aging population
Courtyard housing	None	Addition of Courtyard housing could really help strengthen social fabric and improve livability of an area.
Town house	Yes	Better facilities and proper amenities within the houses could really be appreciated by aging population
Live + Work housing	None	Addition of Live + Work housing units could be better for aging population.
Midrise building	None	-
Assisted Living facilities	Yes	More addition of assisted living facilities could help improve better life for aging population.

4.2.2 Transportation

The sector of transportation looks upon availability of different means of commuting in the city, what areas could be expanded or considered for expansion and the table also makes considerable changes that can possibly take place as far as design or planning suggestions are concerned.

Table – 4.2.2.1 *The table below presents different means of commuting available in city of Lansing.*

Modes of Transportation	**Available means of Transportation**	**What could be done to improve**	**Possible interventions/improvisations**
By Walking	Yes	Add more pedestrian pathways	Modifying street scape by changing the street design promoting pedestrians.
By Biking	Partial	Add provision of bike lanes	Modifying street scape, by adding a bike lane.
By Individual vehicles	Yes	-	-
By Taxi / Uber	Very few	Add provision of uber/life	Provision of taxi services at major civic location like library, schools, civic center, entertainment districts
By Bus	None`	Add provision of state buses	A bus station that allows passengers to travel across the state.
By Train	None	-	-
By flight	None	-	-

From the table 4.2.2.1, we can say that the major issue here is the lack of public transportation options. The city does not have a dedicated bus station, which to me indicates dependence on private vehicles for commuting. The city does not currently possess any dedicated bus service for the people of Lansing and that is the thing that needs change in order to help the people in the community. And the dependence on private vehicles for commuting poses a great threat to aging population as far as safety is concerned. Other than that improving pedestrian infrastructure is another aspect upon which several recommendations can be made to ensure that the city of Lansing is walkable and accessible. As walking is one of the safest means of commuting for aging population.

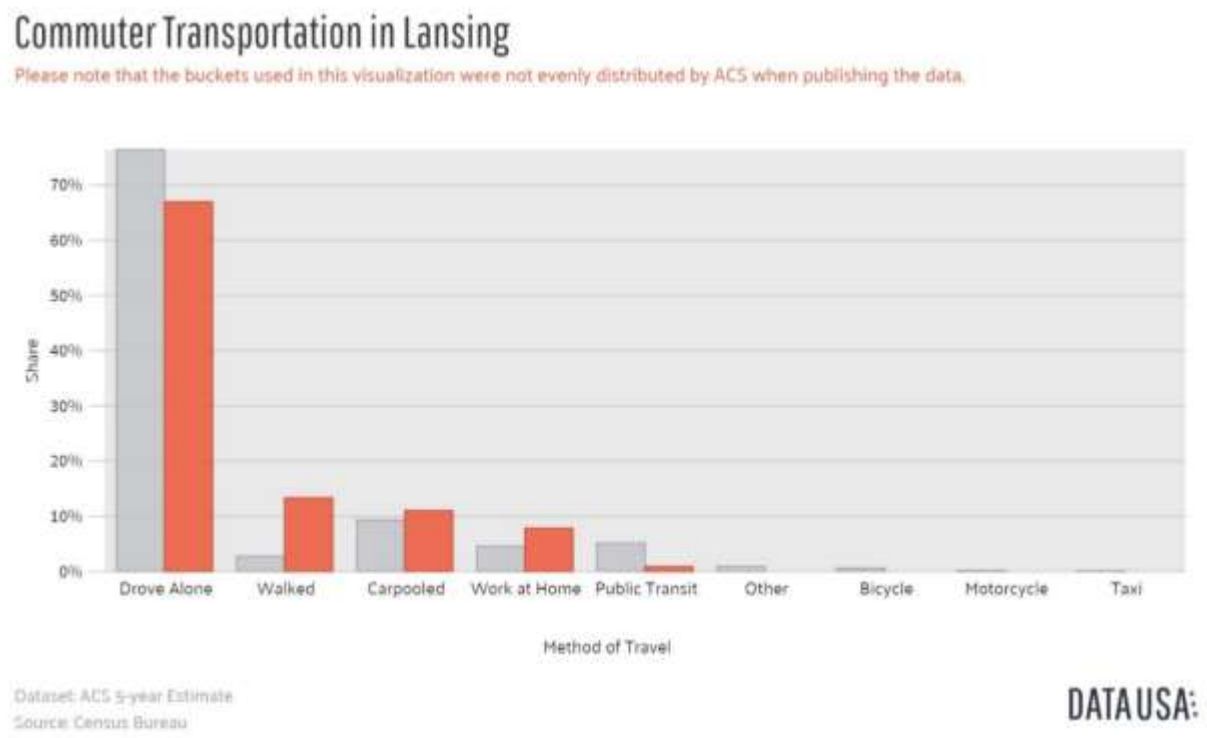


Figure – 4.2.2.1 *The figure above represents a graph highlighting the different means of commuting that people in Lansing prefers.*

Source: Census Bureau, 2016 American City survey 5-year estimate

The figure 4.2.2.1 above highlights the commuting options preferred by users in the city of Lansing. The chart is dominated by drive alone category because of a lack of pedestrian infrastructure and non-availability of public transportation options. However, it is ironic to note down that about 80% of the city area falls within quarter mile radius and still it is not walkable. Physical infrastructure of the city should be used as an opportunity to develop more harmony and livability within community. As we all know that walkability is a solution not only for accessing resources but also strengthens the social environment of a place, provides more security to the people and motivates people to be in good shape and health.

4.2.3 Walkability

Walkability is an important aspect to transform a neighborhood and solving issues associated with the people living in the vicinity. However, to ensure this, we must develop the existing assets that is within the city. The table 4.2.3.1 below describes the existing situations for pedestrian infrastructure that is available to the people of Lansing.

Table – 4.2.3.1 *The table below suggests the presence of pedestrian infrastructure that promotes walkability.*

Modes of Walkability	**Presence of existing infrastructure**	**Possible interventions/improvisations**
Sidewalks	Partial	Add Sidewalks to places where there is absence of sidewalks.

Pedestrian connectivity and infrastructure	Partial	Addition of street furniture, signages and trees. Addition of pedestrian path to improve more connectivity and accessibility.
Width of sidewalk	Inadequate size	Could provide adequate size of sidewalks so that it can be accessed efficiently even on wheelchair.

Existing sidewalks present in the city of Lansing are of inadequate sizes as far as width of the sidewalk is considered and it is necessary to bring the sizes of sidewalks to a standard size so that it can be both ADA (American with disability act) accessible and encourage people to walk.

4.2.4 Accessibility

Accessibility suggests how efficiently people can access several facilities which are important in their day to day life. However, the city of Lansing possesses most of the facilities but some improvements could be done to achieve the maximum benefits of these facilities. However, table 4.2.4.1 lists the presence of facilities at present in the city of Lansing. Bringing technological innovations in these small towns can also provide easy access to resources as far as aging is concerned.

Table – 4.2.4.1 *The table below showcases different facilities that is present in the city of Lansing.*

Types of facilities	**Existing accessibility**	**Possible interventions/ improvisation**
Grocery store/ Convenience store	Yes	Could provide options for online ordering and delivery (Mobile vans)
Civic center	Yes	Addition of some common civic spaces concentrating on aging population could be great.
Library	Yes	A multi-purpose space focusing on social activities for aging population could be great
Major Bus stop	None	A dedicated bus stop with buses twice a week would really assist aging population.
Healthcare facilities	Yes	Provision of assistance staff to aging population on weekly basis could be a great help to elderly.

In sum, from both mapping analysis and considerations made in the field of planning and design we can say that these are the aspects upon which design-based interventions and policy-based interventions can be based. In the following section, several interventions countering both short term and long-term goals for the aging community in Lansing will be classified and conclude our proposed ideas and recommendations as far as needs of aging communities are concerned. The next section of discussion/ conclusion mostly focuses on possible interventions, recommendations and strategies that can be proposed in two main sections of housing and walkability. As housing and walkability are two important areas where constructive suggestions and implementations both in terms of physical and policy level can be made for the betterment of aging population. Issue of affordability, regulations like setback, diversity and density of housing will be discussed in the following section. Suggestions for street design, improving the connectivity, installation of sidewalks and street furniture will be the focus as far as walkability is concerned for the community. Improving conditions of housing as per people's demand and developing pedestrian infrastructure in the city will also promote both physical and mental health of the people in community. Besides this with proper street furniture neighborhoods will be more safety and promote liveliness in the community.

Chapter - 5. Discussion/Conclusion

This section includes the design interventions, planning strategies, policy-based interventions and planning recommendations which could cater the needs of aging population in small towns. These solutions prepared are based upon the case study of Lansing, but these solutions presented are also very general so that any small town can make the use of them for improving the livability of the town and to accommodate an aging population.

The interventions proposed for the new practice manual in the field of transportation, accessibility, walkability, housing and health care facilities must be flexible, mobile, easy to install, easy to maintain and at the same time affordable. The major reason for making it more flexible and cost effective is because the smaller communities/cities are independent cities and for which the cost of adding amenities or facilities in the community is one of the crucial aspects. However, there are many interventions that could be achieved by small improvisations under zoning code of the city and by tweaking or making new policies.

From the proposed interventions and recommendations made in terms of zoning and development regulations for smaller cities, the target is to have two different impacts through these improvements. One is the immediate effect of interventions/policies and the other is the long-term effect on the city. However, these propositions will not only help aging population but will also help people of all ages. This will result in creating vibrancy and harmony in the neighborhood.

Healthcare and financial incentives upon which ageing populations are dependent is one sector that needs immediate attention of government. As this is one such aspect that could impact the economy of a place and a burden on different age group of people. "Older people have greater

health and long-term care needs than younger people, leading to increased expenditure. They are also less likely to work if they are unhealthy and could impose an economic burden on families and society (Whiteman, 2014). However, this section highlights only three areas i.e. Walkability, Healthcare and Housing. To me, all these three areas are relative to each other and are dependent on each other for optimum utilization of the resources.

5.1 Design interventions

Design-based interventions should be very flexible, mobile, adaptable and cost effective, so that the implementation can be done by most of the small towns. The idea is to make these small towns self-sustainable so that they are not dependent on nearing major cities for resources like access to public transportation option, recreational activities, healthcare facilities, entertainment facilities and jobs. This will not only strengthen these towns economically but will also help in retaining population. Also countering problems of an aging population will not only help the aged people but will help people of all ages. Because the goal is to benefit the entire community. However, ageing population is just one of the opportunities for us to counter the urban problems faced by people in small towns. The design interventions below are presented in different sections as we go through the paper.

5.2 Policy based interventions

Policy-based interventions presented in this section of the paper broadly highlights the policies, rules and regulations that can be implemented by small towns to accommodate the needs of ageing population. The changes presented in these sections are basically recommendations that

can be utilized by the community in order to improve the livability in an area, strengthen the social structure, improve the security, increase density and encourage diversity of uses in the neighborhood. The policy-based interventions are presented separately. These strategies have been adequately supported by different practices around the country and some well-known planning and design organizations.

However, major focus is on housing as far as design and policy-based interventions are concerned. As Housing is one of the crucial aspects for living a life and it is one such aspect that always have issues like affordability, lot sizes, development standards, etc.

5.3 Housing

This section proposes mostly the recommendations in terms of managing land uses, rules like setbacks, margins and encourages to use different sets of housing layout to counter the problem of social exclusion and livability. However, in this section there are strategies provide to improve the existing housing conditions as well so that one could immediately act upon it especially the aging population in possession of a detached single-family house.

5.3.1 Concept of Missing middle housing

Missing middle housing is a strategy that proposes a range of multi-unit or clustered housing types compatible in scale with detached single-family homes that help meets the growing demand for walkable urban living. The missing middle housing types provide diverse housing options, such as duplexes, fourplexes, bungalow courts, townhouses, live work units and midrise

type of housing options that fit seamlessly into low rise walkable neighborhoods and support walkability, locally support retail and public transportation options.

Adding more diverse type of housing in the city of Lansing would improve the livability in an area, especially when there is a concern about aging population. Type of housing like Live + Work housing could bring the facilities like grocery stores, cafeterias, health clinics near to the people efficiently. In addition, this could help in providing safety on streets as it makes the area feel more dynamic and forces people to encourage pedestrian means to access different facilities. The Addition of courtyard housing could help strengthen social fabric of the city. It could not only provide good security, but this could also help in aiding neighbors building a sense of community. However, the strategy of inclusion of missing middle housing will not only help town of Lansing and its aging population but can really improve any small town facing urban problems especially the aging population.

Using a block comprised exclusively of Missing Middle types to transition to a commercial corridor

Creating a block of larger Missing Middle housing types is an excellent way to transition from a neighborhood to a Main Street with commercial and mixed-use buildings. These types are generally more tolerant and better able to effectively mitigate any potential conflicts related to the proximity to commercial/retail buildings or parking lots behind commercial buildings.

Figure – 5.3.1.1 *The above graphic illustrates how can we transform the primary street commercial by adding missing middle housing strategy in neighborhoods.*

Source: Assembly. (2019). Retrieved from https://missingmiddlehousing.com/about/assembly

This proposition showcased in figure 5.3.1.1 not only brings facilities within walkable distance but at the same time also prevents sprawl development. It also increases the density in a place that helps in strengthening social bonds, provides good security, eliminates isolation in the neighborhoods and brings livability in the society. In the case of places where there is more ageing population, such developments can provide better facilities to ageing population. Caring and assisting of aging population becomes easier. This type of development will also help to encourage multi-generational concept of living.

Using Missing Middle types to transition from single-family homes to higher-density housing

Smaller scale Missing Middle types are placed on a few of the lots that transition for the side street to the primary street, providing a transition in scale to the larger buildings towards the primary street or main street.

Figure – 5.3.1.2 *The above graphic illustrates how diversity and density of housing can be balanced in a block.*

Source: Assembly. (2019). Retrieved from https://missingmiddlehousing.com/about/assembly

This proposition in figure 5.3.1.2 allows more flexibility for ageing population. Housing facilities could be positioned next to the main street/primary street which comprises of several public facilities like public library, civic centers, grocery stores, medical centers, health care centers and bus stops. Such facilities within walking distance to such housing development can be helpful. This idea will not only make the streets livelier but also will tend to make streets more walkable, thus eliminate dependence on cars, provide more safety in the neighborhood and at the same time the style of living will not be compromised.

It is said that both baby boomers and millennials want something that the U.S Housing market is not currently providing: small, one to two-bedroom homes in walkable, transit oriented, economically dynamic and job rich neighborhoods. (Chris Leinberger, Brookings Institution, Retrieved from Missing middle housing study report, 2018) This makes it completely clear how badly the people want this but the priority of developers about fast construction and easy money is high as compared to the demand of people. Also, 58 percent of Americans prefer "A neighborhood with a mix of houses and stores and other businesses within an easy walk." (National Association of Realtors data, Retrieved from Missing middle housing study report,

2018) This totally suggests that how missing middle housing strategy could be a great solution to provide walkable, safe, diverse and vibrant neighborhood. But in order to implement the strategy of missing middle housing, there are many obstacles.

The major challenge to adoption of missing middle housing strategy is Euclidean zoning where land use and building typologies are segregated into different zones. Besides this, in many places, it is illegal to build dense housing types for example duplex, quads, stacked flat or accessory dwelling units adding more hinderance. Also, buildings were designed and built to fit within the form of a neighborhood and were not developed as per the requirement of people. However, the limitations of missing middle housing implementation can be turned into reality using form-based codes that stipulates size, shape, placement and design elements of buildings. Form based codes are regulations adopted by city, town or county that provides high quality public realm through use of physical form as the principal organizing element rather than separate uses and floor area ratios that is being considered in conventional zoning.

Allowing and encouraging diverse housing types within a neighborhood

Conventional zoning practice assigns blocks and large areas of a city based on land use or allowed activities. Along with use, the zones are often defined and controlled by placing numeric values to their build-out, including floor area ratio (FAR) and a range of allowed density, dividing neighborhoods into single-family residential, multifamily residential, commercial, office, etc. Missing Middle Housing cannot be effectively regulated by conventional, land-use and density-based zoning because these building types often have medium to high densities,

excluding them from the singly-family use zone, but their small footprints with lower heights don't meet the requirements of multifamily use zones.

- There is usually a gap in the range of housing types that a city or county's zoning districts allow, and more importantly encourage, in particular when the zones shift from upper (smaller lot) single-family zones that only allow single-family detached uses/homes and the lower end of medium density/multifamily zones that usually allow much bigger buildings (taller and wider) and also typically encourage lot aggregation and suburban garden apartment-type buildings.

- Density-based zoning districts do not provide the flexibility that are typically inherent in neighborhoods where Missing Middle Housing exists. The Missing Middle types have compatible forms, but often vary dramatically in their densities, thus making them impossible to regulate with a density-based system. Also, in these medium density zone districts, as the lots get larger buildings typically get larger as opposed to a form-based approach that would require multiple smaller buildings once a lot reaches a certain size (frontage width in particular). However, I believe that flexibility is required while proposing the zoning code of the city. The flexibility also tends to develop the town.

5.3.2 The Alternative: Form-Based Coding

Form base code have proven to be an alternative to conventional zoning that effectively regulates Missing Middle Housing. Form-Based Codes (FBCs) remove barriers and incentivize Missing Middle housing types in appropriate locations of a community. FBCs represent a paradigm shift in the way that the built environment is regulated using physical form rather than a separation of

uses as the organizing principal, to create predictable, built results and a high-quality public realm. And, these codes are not mere guidelines and replace the zoning.

Form based code encourages a mix of land uses, often emphasizing walkability in neighborhoods. Besides this, form- based code brings diversity of housing in a neighborhood facilitating requirement of people and increasing density in a neighborhood. Form-based code also addresses the design of public realm and the importance of streetscape design and develop a sense of place. Also, it retains local architecture and character is also emphasized so that identity and uniqueness of neighborhood is achieved rather than seeing cookie cutter development otherwise. Form-based codes include specification of what uses are permitted in a building or place, but focus on the physical character of development, particularly how it relates to the public realm that everyone shares. A growing number of communities across the country and in our region have found that form-based codes are a more precise and reliable tool for achieving what they want, preserving what they cherish, and preventing what they don't want.

Which community can adopt Form Based Code?

- A means of preservation and transformation. (Like preserving physical character of community, ensuring future development in harmony with existing development.)
- An adaptable approach. (Form based codes are not "one size fits all" but tailored to local context, objectives and means of each community)
- Increasing Predictability, lowering risks and expanding options for developers. (A new regulation to facilitate development more effectively. Makes Structure and existing assets are more adaptable.)

The Form-Based Approach to Regulating Missing Middle

The approach to regulating for diverse housing within a neighborhood (blended densities) starts with an approach that uses density as an output not an input like conventional zoning does. As part of the early Community Character Analysis phase of a planning and Form-Based Coding project, a range of housing types appropriate for the community at large is created based on the community's existing physical patterns, climate, and other considerations. A Form based approach provides more flexibility to restrict the type of development. This will allow the city to focus on the actual requirement of development from the people in neighborhood rather than just proposing the development based upon regular zoning plan and land use plan for the city. This flexibility will tend the city to utilize the resources in efficient manner. (Missing middle housing, 2019)

Below are few examples regarding the implementation of form-based code to regulate the planning in the neighborhoods. The diagrams also mention dimensions, setbacks, area and height of the buildings to ensure diversity in a neighborhood is retained. The idea will be clear as the image possess layout, isometric views and real-world image of the typology. Figure 5.3.2.1 below describes three different types of housing options. First being the accessory dwelling units, which are either attached or detached units, mostly in the form of garage to be used efficiently for increasing density in a neighborhood. Second option being the Bungalow court typology that could also bring more density of people per unit area in order to prevent social exclusion and strengthen the social structure of the community. The third typology includes the duplex which generally have two – three bedrooms and could be a great alternative to rental housing.

Figure – 5.3.2.1 *The above graphic illustrates how three different types of housing that can be developed within neighborhood considering the dimensions of lot, building heights, density as far as missing middle housing strategy is concerned in a place.*

Source: The Missing middle housing study., The Montgomery County Planning Department. (2018). Retrieved from http://montgomeryplanning.org/wp-content/uploads/2018/09/MissingMiddleHousingStudy_9-2018.pdf

The figure 5.3.2.2 below elaborates another sets of different housing types which could be termed as medium density housing. Townhouses and Triplex/ Fourplex type of housing are slightly taller than the regular single family housing which allows us to create more rental housing oppoortunities. These typologies could also bring in students and aging people under one roof.

Figure – 5.3.2.2 *The above graphic illustrates how two different types of housing that can be developed within neighborhood considering the dimensions of lot, building heights which adds more density in a neighborhood as far as missing middle housing strategy is concerned.*

Source: The Missing middle housing study., The Montgomery County Planning Department. (2018). Retrieved from http://montgomeryplanning.org/wp-content/uploads/2018/09/MissingMiddleHousingStudy_9-2018.pdf

The next figure 5.3.2.3 below elaborates another sets of different housing types which ensures higher density. Multiplex and Courtyard appartment type of housing allows more number of people staying on a smaller footprint. These two sets of hosing typologies are best suitable for aging population. These could be entirely converted into senior citizen housing appartment or

student housing or a rental housing options available to all age group of people encouraging diversity in age group of people living together and also increases density.

Figure – 5.3.2.3 *The above graphic illustrates how two different types of housing that can be developed within neighborhood considering the dimensions of lot, building heights which adds more density and safety in a neighborhood as far as missing middle housing strategy is concerned for all age group of people.*

Source: The Missing middle housing study., The Montgomery County Planning Department. (2018). Retrieved from http://montgomeryplanning.org/wp-content/uploads/2018/09/MissingMiddleHousingStudy_9-2018.pdf

Further in the paper, case with city of Lansing will be explored. Also, implication of how missing middle housing strategy could be applied as far as Lansing is concerned will be elaborated. Because requirement of people is the topmost priority than the developer's perspective of minting large sum of money.

5.3.3 Existing facilities in the city of Lansing

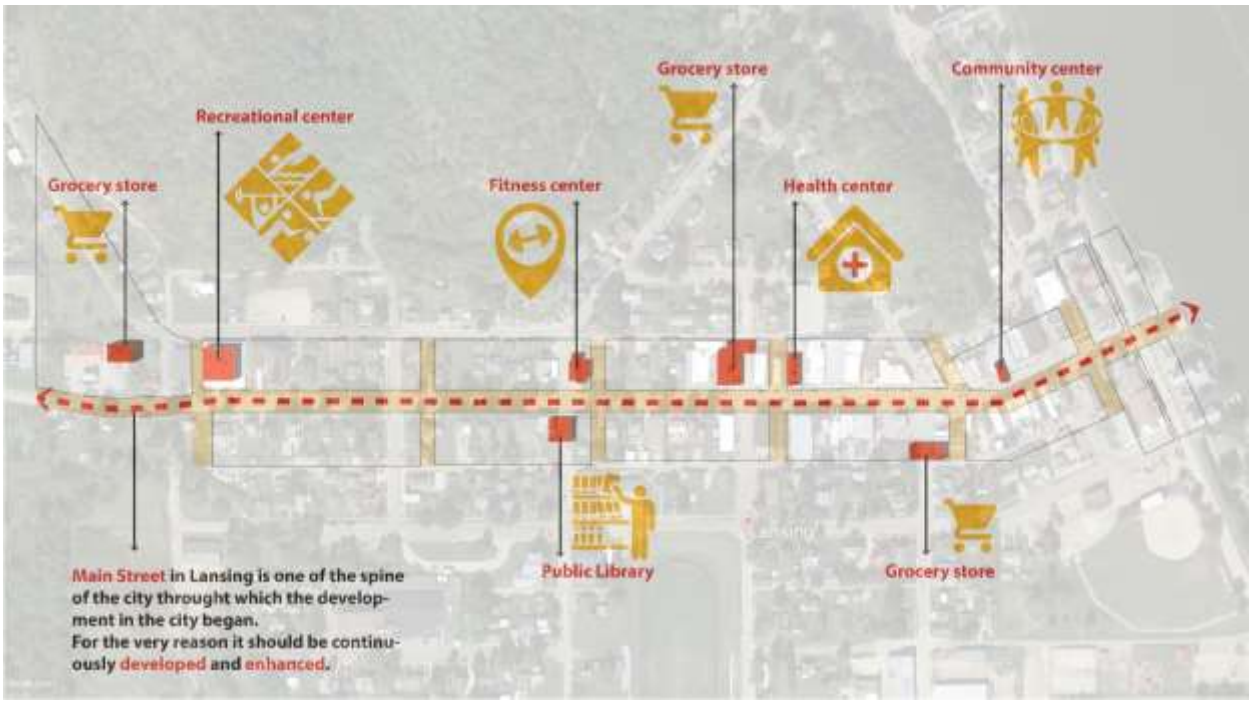


Figure – 5.3.3.1 *The above diagram highlights the existing facilities available in city of Lansing.*

Source: Author, 2019

The diagram 5.3.3.1 highlights the primary street or main street in Lansing which is the spine of development in city and highlights the existing locations of facilities available in the city of Lansing as far as aging population is concerned. However, the next diagram 5.3.3.2 will

showcase the existing land uses of the city of Lansing, as it is important to verify the existing uses before proposing or recommending new uses or forms.

Figure – 5.3.3.2 *The above diagram showcases the existing land in city of Lansing around the main street.*

Source: Author, 2019

The next section will investigate more detail of existing housing forms within the city of Lansing and then will develop my suggestions and recommendations as far as housing form and type is concerned.

5.3.4 Forms and layout of housing

This section will be showcasing many diagrams, illustrations and maps that will project both existing scenario and proposed scenario of street scape and housing form in city of Lansing.

Recommendations made as far as housing is concerned is through proposal of several housing forms and types that increases both density and diversity of housing in a neighborhood. This arrangement will not only bridge the social structure in neighborhood but will also help in maintaining adequate sizes of house especially considering the case of aging population.

Bringing facilities closer to people by introducing live/work units will not only solve problem of accessibility to facilities for people in the neighborhood but will also promote walkability. Walkability in turn will promote healthier lifestyle, especially for aging population. Bringing commercial retail outlets closer to residential spaces makes the area more vibrant. This also adds up density of people living in a neighborhood which strengthens the social fabric in a neighborhood by promoting multifamily housing apartment, courtyard type of housing especially for aging population. More density in a neighborhoods and good pedestrian environment also brings more security in a area thus making the surroundings more safer.

The diagram 5.3.4.1 shows a map of Lansing in which two sites are selected randomly for making recommendations and suggestions. The map retains the existing land uses of the city so that we can make relation to the proposed new uses.

Figure – 5.3.4.1 *The above diagram showcases the two sections of Lansing city which we can transform by suggesting or recommending diversity of housing forms and types.*

Source: Author, 2019

The following diagram 5.3.4.2 involves proposal of new housing form in the site 1 area refered in figure 5.3.4.1. Courtyard type of community housing is proposed in place of single family housing. However, this is broken down into three townhouse units and two Live/Work units. Live/Work units will have some retail spaces on ground floor so that the context of site could benefit by accessing facilities in walkable distance. To promote waalkability, a peripheral sidewalk and a patch of green space is also proposed which can act as community space for people of all ages in the neighborhood. More pedestrian areas within the area will encorage walkability and strengthen safety of people. Overall, the rental units will also bring in diverse age of population and benefits to aging community.

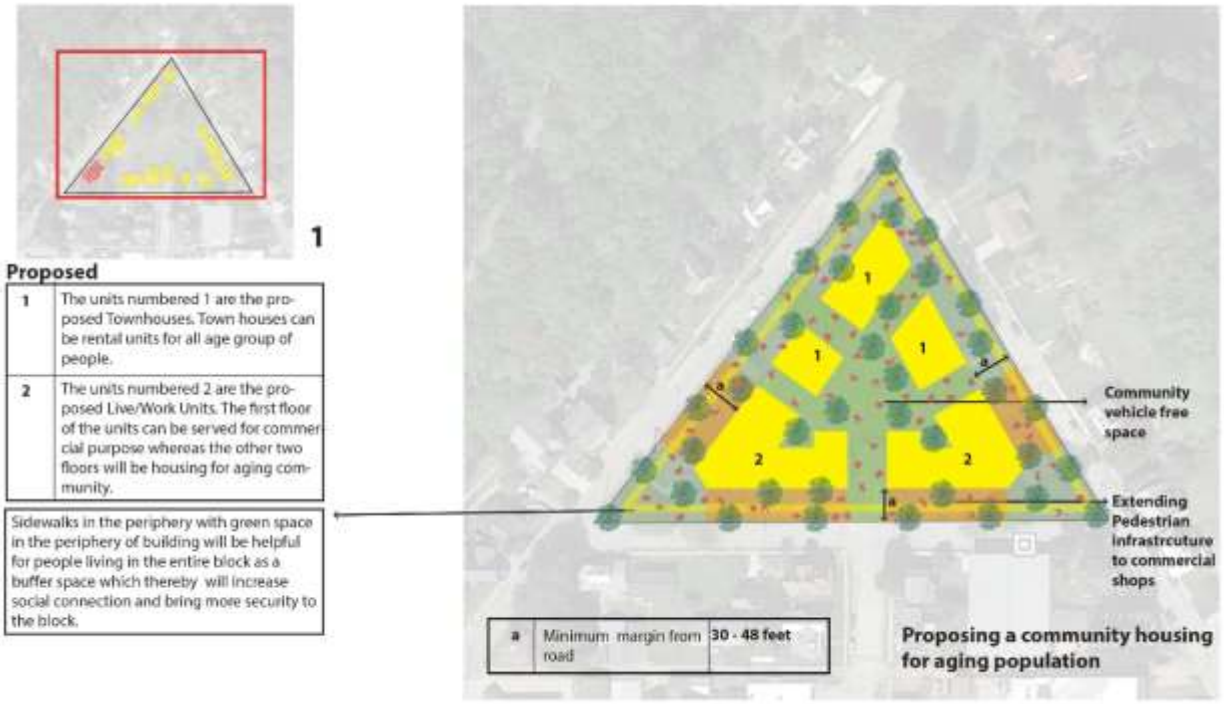


Figure – 5.3.4.2 *The above diagram highlights the proposal of new housing forms and types for aging population in the city of Lansing for site 1.*

Source: Author, 2019

The figure 5.3.4.3 below suggests the proposal and recommendations made for site 2 which is being highlighted in figure 5.3.4.1. The proposed section includes diversity of different housing types in the block. The proposition includes L- type multifamily housing, courtyard type of multi-family housing type, multi-family housing apartment, a commercial building, single family housing cluster and multi-family housing cluster with community space. The two multi-family units falling on the main street of Lansing are live work units which suggests that the units comprise of retail stores at street levels. These retail stores could serve as new places for facilities like grocery store, health clinic or civic center. These additions of facilities will bring

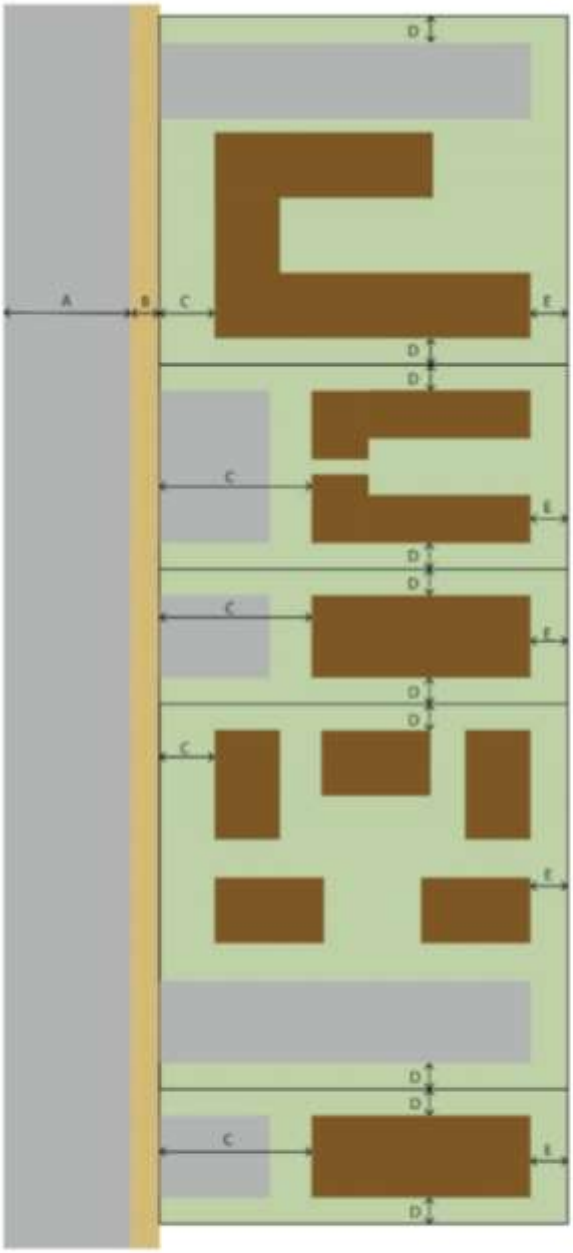
more vibrancy in the neighborhood. Also, the proposed walkable infrastructure will promote walkability in neighborhood as well.

Figure – 5.3.4.3 *The above diagram highlights the proposal of new housing form and type for aging population in city of Lansing for site 2.*

Source: Author, 2019

Further in the paper, some general rules that should be kept in mind in order to achieve diversity in housing within the neighborhood. Figure 5.3.4.4 mentions some of the rules and regulations like setbacks, margins which are part of the zoning document of the city planning department. However, using this recommendation will be immensely helpful for people by providing

different forms of housing and different benefits that can be availed through implementation of these diversity of housing. This diagram proposes a scenario for any community, as these regulations can be applied to any city/towns. The regulations and rules are very general.



Item	Discription	Recommendation
A	Width of road	30 - 60 feet
B	Width of sidewalk	12 - 18 feet
C	Front margin for building	30 - 72 feet
D	Side margin for building	12 - 18 feet
E	Rear margin for building	12 - 18 feet

Figure – 5.3.4.4 *The above diagram presents the arrangement of different housing forms and types in a block along with recommended margins.*

Source: Author, 2019

In the next segment of paper, a current example Ingersoll development in Des Moines, Iowa will be highlighted to understand how we can make changes to existing neighborhoods by bringing in form-based coding and achieve diversity of uses and increase density of housing in a neighborhood. Making the neighborhood safer and more walkable by paying more attention on pedestrian movement of people across the neighborhood. The example is to understand how we can impose form-based coding over conventional zoning in order to bring a better change in neighborhood.

Example: Ingersoll development, Des Moines

Zoning regulations are a tool community use to protect property values and guide future development in ways that support an established vision. In this case, Ingersoll development in Des Moines, Iowa is one of the classic cases of how form-based coding works not only to bring vibrancy in a neighborhood but also preserve the existing historical development. The figure 5.3.4.5 below showcases the zoning map highlighting the Ingersoll development in Des Moines, Iowa.

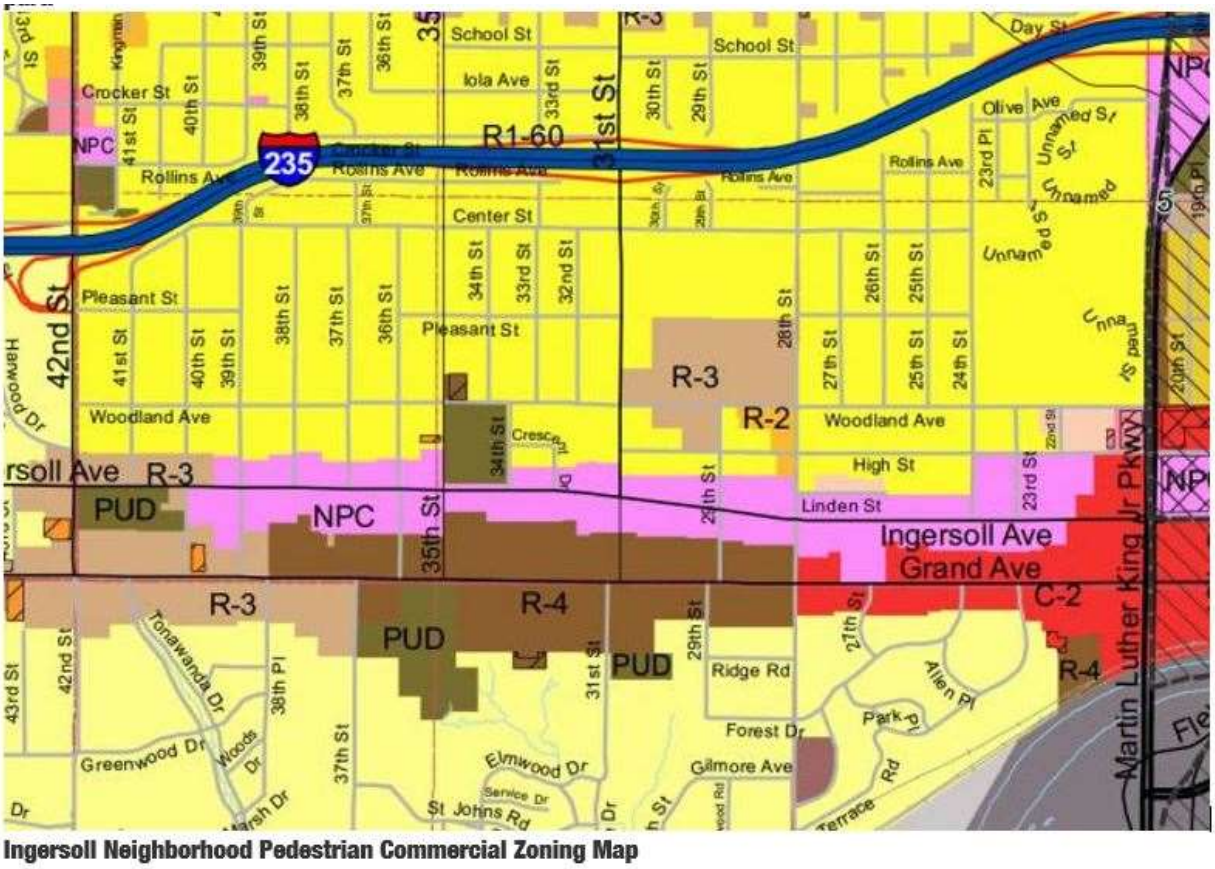


Figure – 5.3.4.5 *The above figure is the zoning map for Ingersoll development located in Des Moines, Iowa*

Source: The Des Moines Perspective. (2018). Retrieved from http://dmperspective.com/content/ingersoll-development-neighborhood-pedestr

The Neighborhood Pedestrian Commercial (NPC) district was established to aid in the preservation and stabilization of commercial corridors by:

- Improving pedestrian access
- Promoting retail density
- Protecting the adjacent residential districts
- Protecting the character of the district

This district type is characterized by multistory brick apartments and one- and two-story commercial buildings with multiple tenants and minimal setback from the primary commercial

street. It is intended to include specialty retail and office uses that serve the adjacent residential areas as well as the entire city.

Some of the key elements of the NPC are highlighted below

- **Setbacks:**

  Buildings should frame the street and maintain a minimal setback from the street. The idea behind this requirement is to encourage a walkable, urban feel instead of a suburban strip mall feel.

- **Encouraging Pedestrians:**

  Pedestrians are typically safer and more comfortable walking parallel to the street, separated by a zone of parking/planting. The front facade of the first floor of the building on the primary commercial street should have a ratio of at least 40 percent window and window display area to total street facade. The more windows, the better the relationship between the pedestrian and the business.

- **Parking:**

  The minimum number of off-street parking spaces is 60 percent of the number of spaces otherwise required. Parking should not use the front yard but should be concentrated along the side and behind the building in the predominant pattern of character defining buildings. Shared parking allows for resources to me more efficiently allocated.

- **Landscape:**

  The landscape plan should generally enhance the visual appearance of the building, parking area and any pedestrian areas. Plantings are an important component to the appearance and functionality of the district.

The example above portrays a great example to make use of existing assets and bring strategy to make the place more vibrant. Further in the paper, another concept that is Multi-generational concept of living will be elaborated as it is going to change how we perceive housing markets in the city today.

5.3.5 Multi-generation concept of living

Multi generation concept of living means to rent or to sell the different units in apartments or rooms within the same house to people from different age groups in order to use the space to its efficiently and at the same time also contributing to the notion of housing affordability. Involving multi-generational concept of renting spaces could also be a great value in accommodating the growing aging population. As it bridges the age barrier and counters the problem of social exclusion. A rental house can be a good choice for multi-generational families. A duplex or triplex works well if a family is fortunate enough to find two close units that are available at the same time. Of course, renting both sides of a duplex, or two units in an apartment building, means double rent for a family.

This concept of multi-generational home does not only facilitate caring among different age groups but also helps to be more economical. Children in this case benefits by good attention, care and better education. In addition, life expectancy of older people tends to increase as they still live in a place where they can play with children, have good social interaction and can have help from the younger generations. This eliminates the problem of social exclusion, accessibility of resources for ageing population and improves health and wellbeing of the entire family in the house both physically and mentally. Many of the same design adaptations that make aging in place possible for seniors also make spaces safer for small children. Example include ramps

instead of steps and grab bars in showers and tubs. Multigenerational households may also benefit from the services many seniors use when they live alone, such as concierge services to delivery groceries and in-home care for adults who need extra help with daily tasks. (Barton, 2017)

Affordability in housing market is one of the major issues today. The condition being that everyone wants to stay in downtown where they can easily access resources but at the same time there is shortage of spaces in the downtown and the rent is very high. However, both millennials and ageing population can perform better if they get a chance to stay in downtown but high-end prices are the barriers. “When it comes to the hip housing in downtown areas, millennials want it, but seniors need it” (Sisson, 2017) Whether due to changing economic circumstances, increasing cultural diversity that welcomes such arrangements, or the evolving lifestyles of older Americans, more families in the U.S. are embracing more traditional living arrangements.

Permitting and zoning are big barriers to providing multi-generational housing. The “dead hand of single-family zoning” preventing more informal, reactive responses to overcrowded family homes. However, making recommendations as far as layout of housing and form of housing is concerned, a lot can be done to improvise the existing large chunks of single-family housing units in the city. (Sisson, 2017) Schemes like Alley Flat Initiatives and Accessory dwelling units (ADU) Pilot Project aims to increase city’s affordable housing stock and make it easier for families to add new units to their properties.

5.3.6 Benefits of ADU (Accessory Dwelling Unit)

ADU's provides an additional source of income through its rent. It is either detached or attached next to single family house on a lot. Construction of ADU in a lot brings not only diverse uses but also increases density of people per unit area.

In case of elderly people in possession of single-family house on huge lot, proposition of ADU might help them to incorporate rental multigenerational house. They can rent it to students/ youths or single parents. The benefit is that the cost is affordable to many renters. Privacy and security is also well ensured. Provision of ADU's in a lot may help to increase socialization between ageing population and can also eliminate issues of depression and social exclusion. ADU'S can be part of single-family zoning in the city as it serves the best purpose. In addition to it, proposition of one single house segregating different places could also be introduced so that the diverse age group could live under one single roof. If you have a reasonably sized house, and an even more reasonably sized ADU, you've likely got a green combination with some social benefits as well. You could have your best friend, your mother, or your grown kid, live with you. This kind of flexibility and informal support could really help as the nation's population ages. Most people want to stay in their homes as they age, but finances and design can be problematic. An ADU could help aging people meet their needs without moving. (Martin, 2014)

The figure 5.3.6.1 presented below describes how efficiently we can have ADU's in place especially in the place where single family housing is abundance in number. Having large number of single-family housing is mostly seen in the case of smaller towns and to me this is an opportunity for one to make use of the resources to promote efficient and smart living.

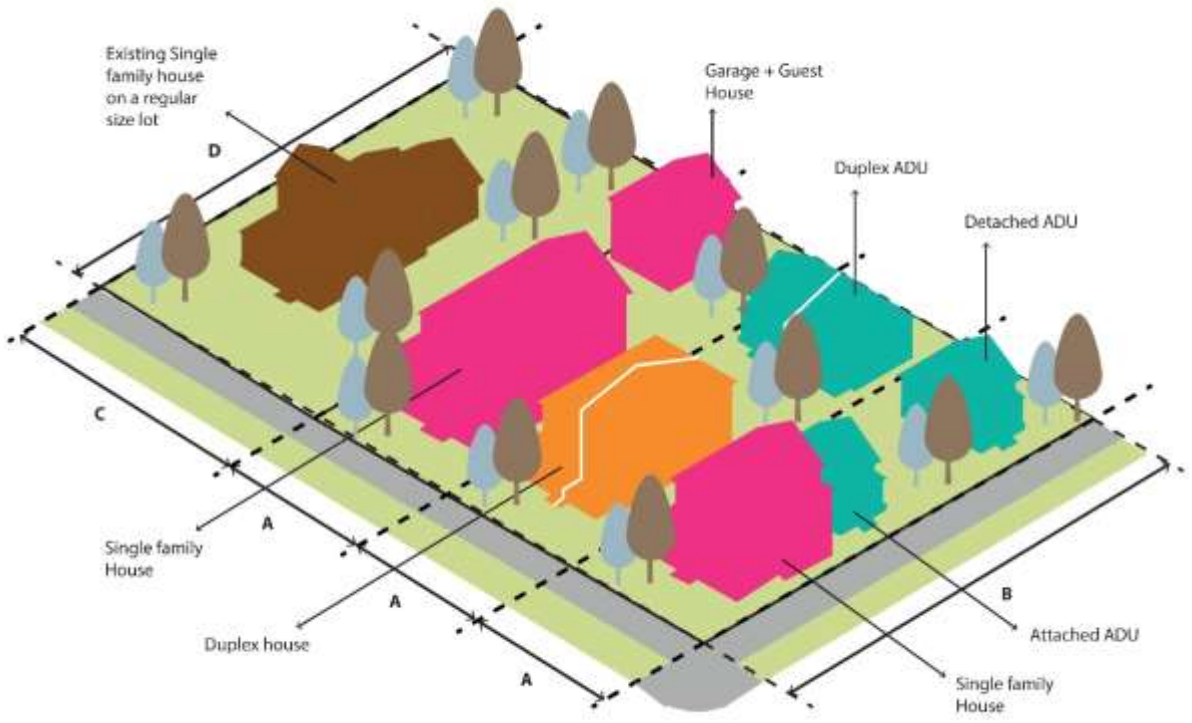


Figure – 5.3.6.1 *The above diagram shows how can we adopt to ADU units within existing housing infrastructure in a block.*

Source: Author, 2019

Table – 5.3.6.1 *The table below presents the recommendation in terms of length and breadth should be maintained for a lot in a block.*

Notations	**Description**	**Proposed Dimensions**
A	Width of the lot	60 - 80 feet
B	Length of the lot	160 - 200 feet
C	Existing Width of lot in zoning	80 - 120 feet
D	Existing length of lot in zoning	200 - 300 feet

The proposed dimension in the above table 5.3.6.1 suggests how reducing the current lot sizes can have greater impact to eliminate urban problems like social exclusion, security, livability and affordability. Changing the lot sizes and increasing density will also reduce the infrastructure cost of the city like roads, electricity, sewers and water. At the same time also bring vibrancy in the city. Concept of ADU's in a neighborhood not only adds density of people per unit area but also brings together different family type together. Having diverse family group in a neighborhood brings more character in neighborhood. At the same time chances of getting assistance increases. Today's concept of Airbnb's is one of the best examples to witness the changes taking place in people's perception. Airbnb's not only generates extra source of income for family but also opens door for increasing social and cultural connections between people. However, the belief of US society for having ADU's in their surrounding is not strong but incentives like economic benefits and having tax credits can push people to promote ADU's in their surroundings.

A case in the Netherlands suggests how can the ageing population be utilized to develop a great housing market. Mixed-age cohousing helps students and seniors in the Netherlands. The Humanitas retirement community of about 160 seniors is also home to about half a dozen college students who enjoy rent-free private apartments in exchange for being active members of the community. For at least 30 hours a month, student residents spend time talking with their older housemates and helping with tasks and errands. The students get to keep their expenses down and enjoy a quieter environment than rowdy student housing, while seniors get more social interaction and attention to help stave off depression and cognitive decline. (Barton, 2017) However, the perception of planners needs to shift from minting more money towards the actual requirements of the people in the neighborhood or the city. This shift will not only benefit an

aging population but will also benefit single parents, bachelors and students for whom the affordability is of utmost importance in early stages of professional life.

The figure 5.3.6.2 below illustrates how effectively these arrangements of different types of housing in a block can be accommodated thus making efficient use of land. This suggestion will lead to an increase in density of the area at the same time also help lowering the cost of housing in an area which is one of the major urban problems today. Especially, considering the case of aging population, such layout can help to achieve greater assistance as far as neighbors are concerned. If implementation of such housing types in a block is rented to different age group, the multi-generational concept of living can be a great resort. This arrangement will also help to keep the privacy of individuals and at the same time help one another in the best possible manner.

Figure – 5.3.6.2 *The above diagram shows how efficiently we can achieve diversity of housing type in a block that promotes density.*

Source: Urban Space. (2019). Retrieved from http://kronbergwall.com/blog/

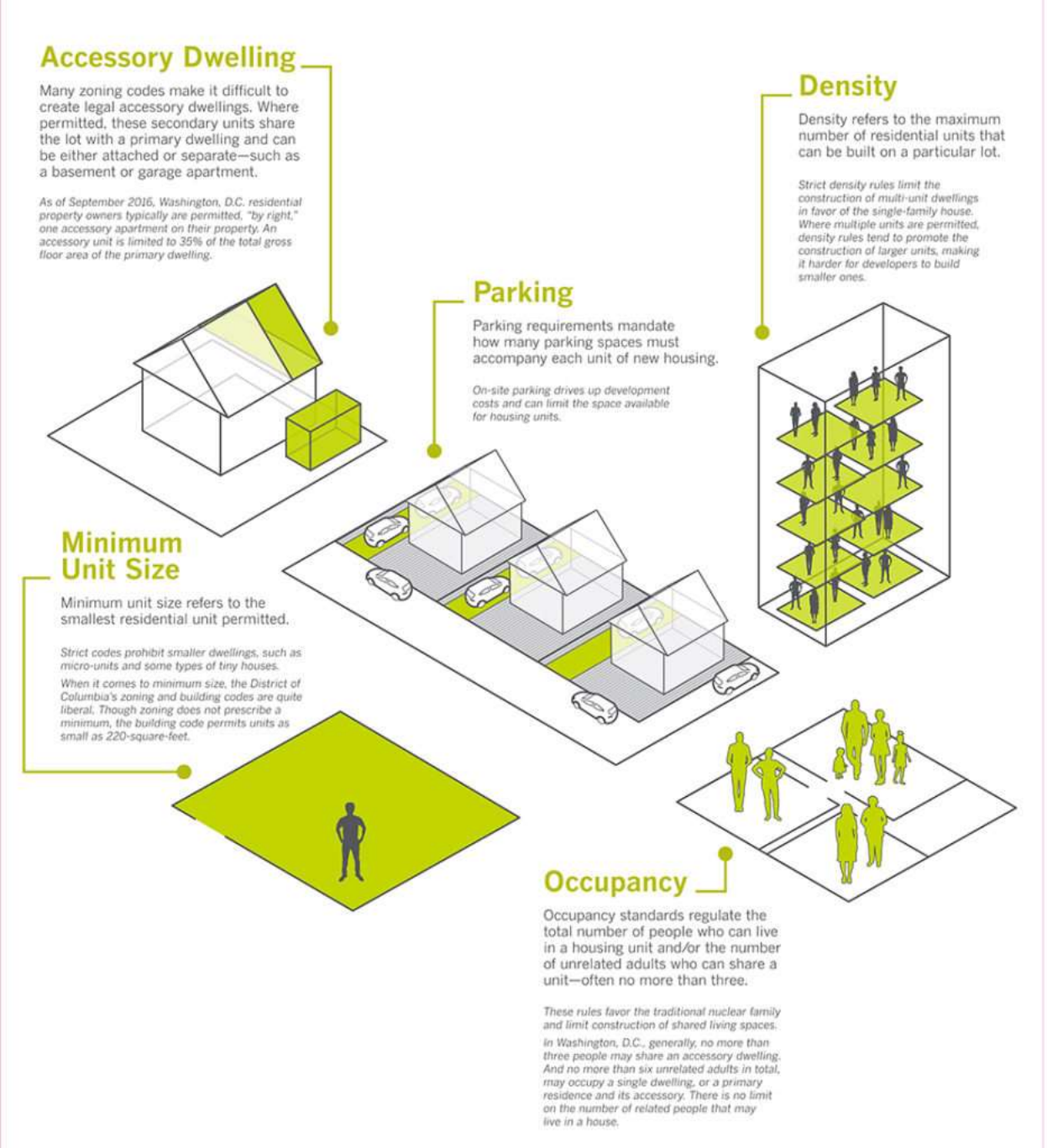


Figure – 5.3.6.3 *The above diagram shows a unique data model that reveals the diversity of 21 st century household configuration.*

Source: Making Room - Housing Typologies. (2018, January 12). Retrieved from https://chpcny.org/research/making-room/

The figure 5.3.6.3 above indicates how implementation of minimum lot sizes, increasing density of people per unit area and adding facilities like ADU's in a place can be an effective solution for not only for ageing population but for the entire community in general. This brings a variety of benefits to the people occupying these types of housing development and increases vibrancy within the city. However, increasing density of housing units in an area is not a traditional concept that United States is practicing but keeping in mind the housing shortage, affordability and quality of housing requirement in 21st century, a shift in implementing new strategies should be preferred.

The figure 5.3.6.4 presented below indicates the facilities that are essential for a single-family housing in a neighborhood especially for the aging population. Having amenities like surveillance cameras, standards for ageing population especially in kitchen and toilets, a good temperature control system, smart security system and advanced entertainment devices could really help the elderly to live a great life with existing resources they possess. At the same time the notion of ageing in place is also not disturbed and the aging population can live with their independence and own freedom unlike going to expensive elderly care facilities or gated communities.

Figure – 5.3.6.4 *The above diagram shows how having different amenities within the existing house can make aging population independent.*

Source: Author, 2019

5.4 Street design

The next section of figure shows the existing scenario of the main street of Lansing through street sections. There are two sets of street sections termed case 1 for section through housing side of main street and case 2 for section through commercial side of main street. The major reason being that both these sections have different type of margins, street section. Figure 5.4.1 and figure 5.4.2 below showcases the existing street section of main street in Lansing, thus highlighting two different scenarios.

Figure – 5.4.1 *The above diagram shows the existing street section of the main street in Lansing next to housing uses, (Case -1)*

Source: Author, 2019

Figure – 5.4.2 *The above diagram shows the existing street section of the main street in Lansing next to commercial uses. (Case- 2)*

Source: Author, 2019

The next two figures 5.4.3 and 5.4.4 presented below are the proposed street sections of the main street of Lansing. The proposition is not only in terms of street design but also includes width of pedestrian path, margins/setbacks of building on main street and also street furniture's. However, both the figures will have slight change in section because of prominent commercial uses present in one section than the other.

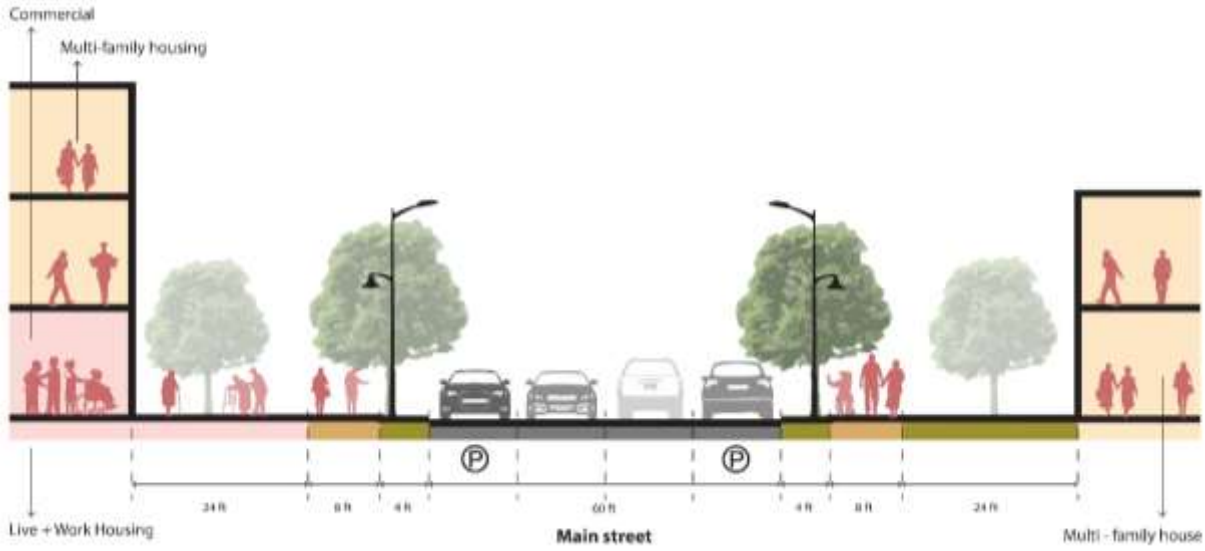


Figure – 5.4.3 *The above diagram shows proposed new standards and regulations for street scape for main street in Lansing. (Case – 1)*

Source: Author, 2019

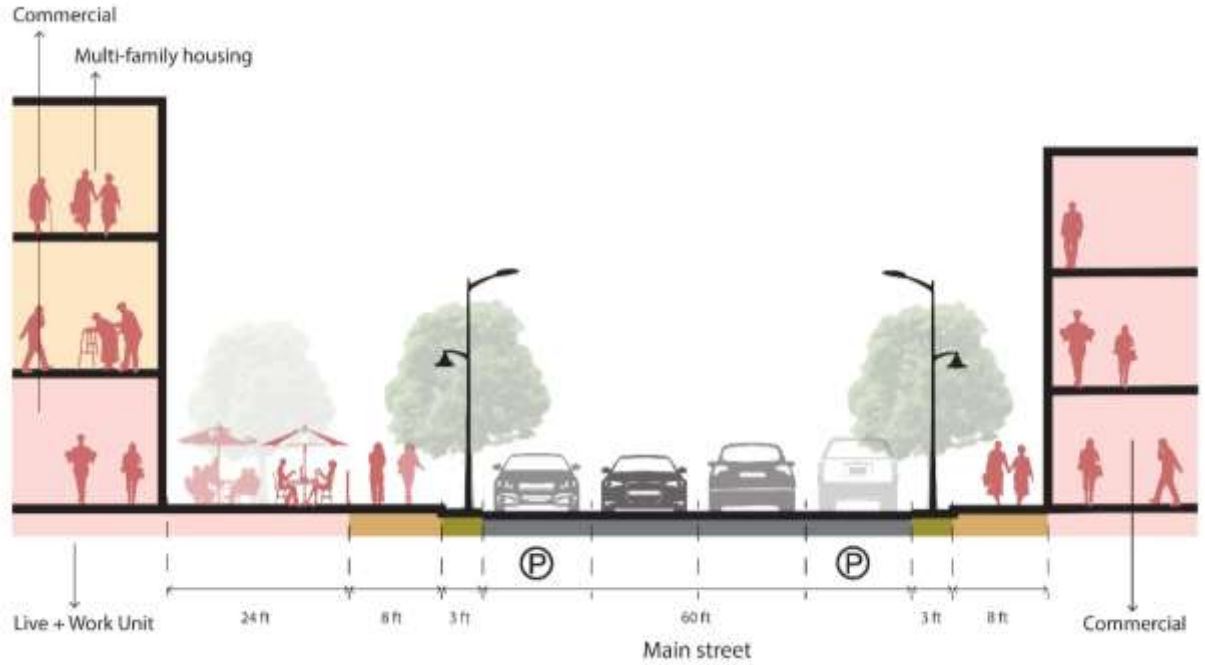


Figure – 5.4.4 *The above diagram shows proposed new standards and regulations for street scape for main street in Lansing. (Case – 2)*

Source: Author, 2019

5.5 Other general regulations

Aging populations pose a challenge to the fiscal and macroeconomic stability of many societies through increased government spending on pension, healthcare, and social benefits programs for the elderly. This may hurt economic growth and overall quality of life if governments need to divert public spending from education and infrastructure investment to finance programs for the elderly. Therefore, pertinent and prompt policy solutions are necessary to ensure fiscal and macroeconomic sustainability as well as the health and well-being for citizens of all ages. (Nikolova, 2016)

Policy makers could consider improvements in two areas (i) a gradual retirement scheme allowing older individuals to lower their working hours yet remain in the workforce and pay taxes until a later age and (ii) furnishing options for and rewarding volunteering, care, and artistic activities among older society members. Also, with improvements in technology every day, technology could be utilized to provide accessibility to resources for an ageing population. "New technologies also offer many ways of bringing health care to underserved older populations more efficiently, especially in rural areas," they add, noting that use of mobile clinics could be optimized, which offer an array of services usually found in hospitals. (Whiteman, 2014) Strategies like the following can also be thought of when we are dealing with ageing population in general. These strategies could also benefit smaller towns which are prone to ageing population.

1.Phased-in retirement, fiscal sustainability, and well-being

First, phased-in retirement allows continuity in tax revenues and reduced expenditure on pensions, which holds importance for fiscal and macroeconomic stability. Second, older workers can be valuable to organizations and younger colleagues due to their knowledge and experience. And third, late-life work has positive health and perceived well-being consequences for older employees. (Nikolova, 2016)

2.Promoting and rewarding volunteering, care, and artistic work among the elderly

Providing incentives and encouraging the elderly to engage in creative work related to painting, music, or creative writing can also be beneficial to society and prevent social isolation. Governments can promote such activities by financing arts and crafts courses in social clubs or community centers for older participants. (Nikolova, 2016)

3.Adapting the Caregiver Workforce for an Aging Population

Labor accounts for approximately 60 percent of healthcare costs in the United States, making an efficient and effective workforce a critical policy priority, particularly for complex geriatric patients. Policy interventions that could affect the use of new models of care include expanding the role of family caregivers; leveraging the unique skills of the nursing profession; training the workforce in geriatric competencies; coordinating interprofessional teams to manage care; and identifying opportunities for engaging community health workers. (Addressing the Health Needs of an Aging America: New Opportunities for Evidence-Based Policy Solutions, University of Pittsburgh)

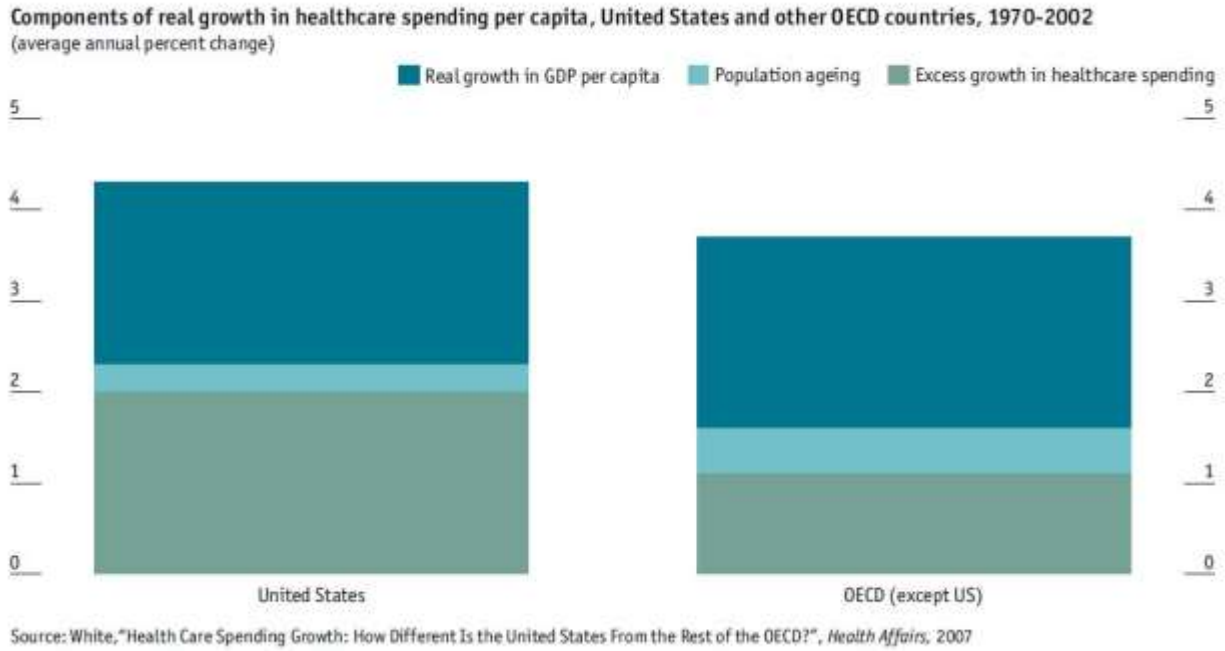


Figure – 5.5.1 *The above diagram presents a comparative analysis of growth in healthcare spending per capita in United states and the rest of the OECD countries.*

Source: White, "Health Care Spending Growth: How Different Is the United States from the Rest of the OECD?", Health Affairs, 2007

In developed countries, challenge is how to accommodate and plan for an ageing population. The OECD, comparing the previous and next three decades, says that economic growth could be cut by one-third because of age related labor force changes. At the same time, more people over 65 means more voters over 65, who will be anxious to protect state provisions for their retirement and care. (Healthcare strategies for an ageing society, The Economist) This can be witnessed in above mentioned figure 5.5.1.Overall, the section of discussion and conclusion elaborates broadly on several department of planning that can be countered with suggestions, recommendations, interventions both designs based, and policy based to uplift smaller cities with

growing ageing population. The next section of the paper conveys how this research could contribute to the communities. As I believe that role of planner or urban designer is all about giving back to the community and rendering services and best possible solutions to help people in the cities.

5.6 Walkability

Width of Sidewalk:

There are two types of sidewalks that are identified in the city of Lansing based upon the width of the sidewalks. The primary kind of sidewalks which are developed on the main street which are 6 feet in width whereas the secondary kind of sidewalks are the one which are developed in the city apart from the main street, i.e. neighborhoods. This sidewalk is 2.8 feet in width at some places and 3 feet in width in other places.

As per guidelines of ADA accessibility, sidewalk width requirements exist to make sure sidewalks are accessible for use by wheelchair-bound individuals. The minimum width for an ADA-compliant sidewalk is 36 inches (3 feet), though sidewalks can be constructed wider than this as this should not also create barrier for others to walk as well.

The figures 5.6.1 below highlights the typical sketch of a pedestrian path that can bridge the gap between walkable infrastructure and ability to walk for the people in Lansing. And figure 5.6.2 below highlights the problem with width of sidewalk in neighborhoods or on interior streets where the width of sidewalk does not permit adequate space for people to use the pedestrian path. In my view, the problem of not enough width of sidewalk in neighborhoods is persistent throughout United States.

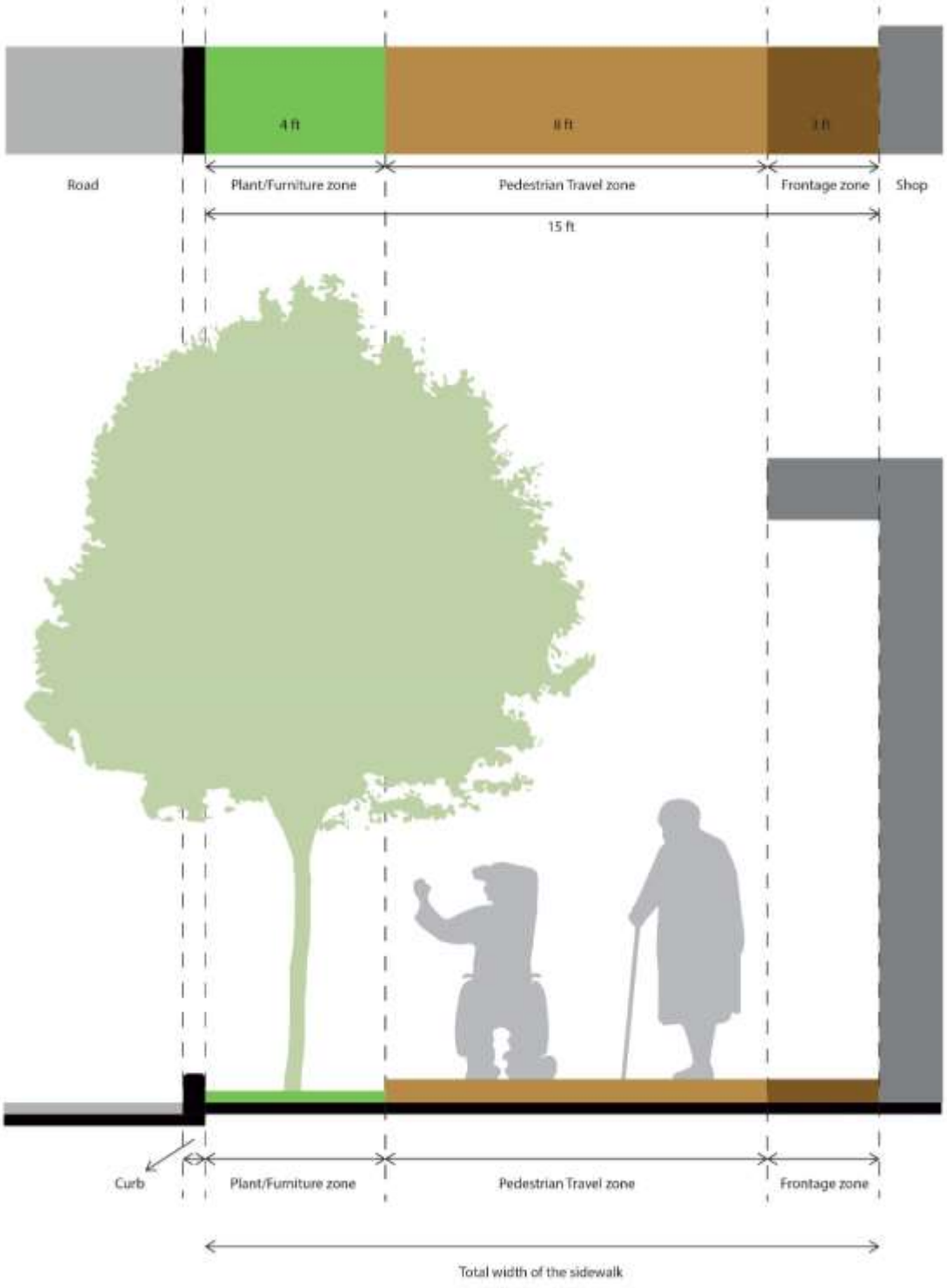
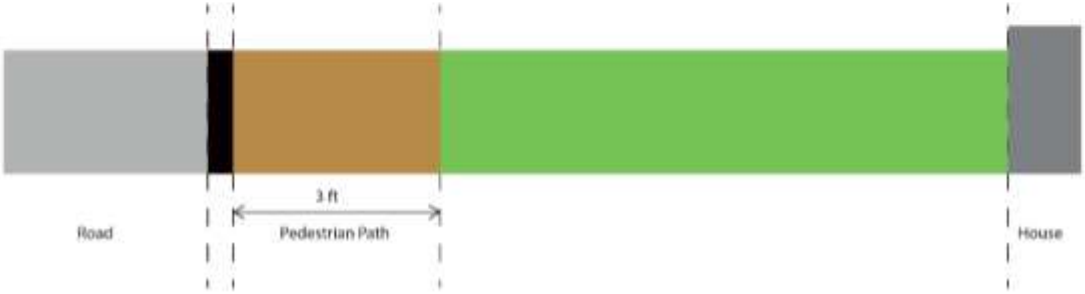


Figure – 5.6.1 *The above image showcases a sketch of typical sidewalk that can be implemented in the city.*

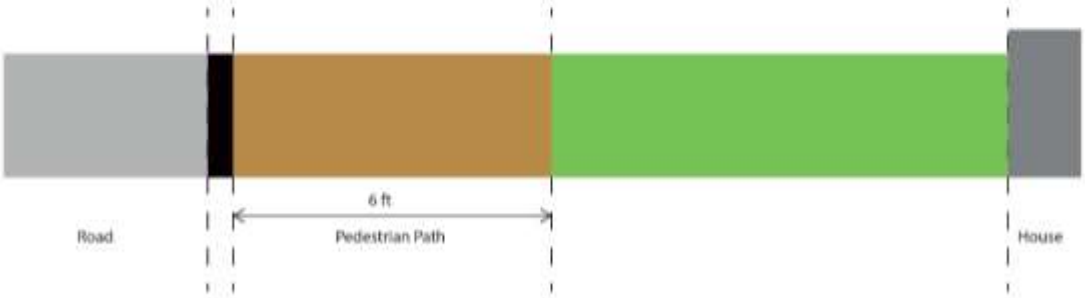
Source: Author, 2019

Type A



Type B

Existing Sidewalks in neighborhoods



Proposed width of sidewalks in neighborhoods

Figure – 5.6.2 *The above image shows both existing and proposed width of sidewalk in neighborhood.*

Source: Author, 2019

The major reason being that the streets and sidewalks are not designed for pedestrian movement or in other words it is designed for car centric development. Besides this the cost associated with installing sidewalk is higher. Figure 5.6.3 below provides an evidence of why the city is hesitant to install bigger sidewalks that serves to people of all age group rather than installing sidewalks of less width. However, convenience should be prioritized over installing of lesser width sidewalk that is not utilized by people in the community.

Item	Unit Cost	Quantity	Line Cost
Concrete sidewalk: excavate, prepare, pour, and broom finish 200 linear feet of 48" wide by 3" thick slab with rebar, wire mesh, and aggregate/sand base.	**$9.53 per foot**	**200**	**$1,907**
Upgrade: earth tone color and pavers-embossing.	**$1.67 per foot**	**200**	**$334**
Material Cost	**$11.20 per foot**	**200**	**$2,241**
+ Labor Cost (base)	**$36 per hour**	**40**	**$1,440**
+ Labor Cost (upgrade)	**$36 per hour**	**10**	**$360**
Total Cost	**$20.20 per foot**	**200**	**$4,041**

Figure – 5.6.3 *The above image presents estimate of installing a sidewalk in a city.*

Source: Concrete Sidewalk Costs. (n.d.). Retrieved from https://howmuch.net/costs/sidewalk-concrete-install-build

The lack of knowledge among planners or government regarding inability to use sidewalks or dependence on vehicles for commuting should be addressed by providing adequate infrastructure that promotes pedestrian movements. On the other end if we consider the case of aging population, walkable environment will be a boon for development as it brings accessibility to facilities nearer and makes commuting easy.

Overall, both housing and walkability are key issues in any city and countering with better solutions like one mentioned in this chapter will be the likely scenario not only to address needs of aging people but to bring vibrancy and character to the entire community. However, strategies to counter existing development are also mentioned above because making wise use of existing assets in the neighborhood is the key to develop a sustainable and vibrant neighborhood which is more diverse, dense, safe, economic and walkable. The next section of the research paper looks at the major contribution of research work. This also looks at instances through which the research can be further carried upon. However, few conclusions from this section will make the research more concrete.

Chapter - 6. Contribution / Future research

The goal of this research is to develop best practice manual for small towns in Iowa which will be faced by the increase in old age people soon. Overall this study involves walkability as one of the major aspects in understanding the issues faced by the aging community in small towns. Walkability will help me understand (1) Accessibility to resources, (2) Pedestrian paths suitable for walking or biking, (3) Diversity of land uses and (4) Density of the area. However, I believe that these four factors will set up good base for research upon which I can develop a planning model for the entire town. As it is said that denser, more walkable urban environments have also spur more social interactions of the sort that encourage creativity, as well as higher levels of civic engagement.

Other major contribution would be to provide recommendation for policy. I believe that several recommendations can be made if I am able to develop a practice manual for small cities, so when the city grows in future, the urban problems doesn't arise and instead they are ready to mitigate the problems efficiently. Public policy has an important role to play not only in removing physical barriers to social inclusion due solely to age and ability, but also in reducing overt and covert social barriers that prevent full participation in all aspects of communal life (Scharlach, 2012) In response to this I am looking for policy changes like how the older population could be engaged in part time work, what are the possible changes to be made on infrastructure level, keeping in mind the ADA accessibility for older people and measures that could be taken to improve social fabric of the community.

It is anticipated that the best practice manual which I am trying to develop for aging communities will have wider impact on the smaller towns. As I believe that change must begin from a smaller scale so that when the town grows, the urban problems does not arise. Ageing-friendly

communities are characterized by physical and social environments that promote social inclusion of older community members by providing opportunities and supports in five areas that have been found to be of relevance in the latter part of the life course:

- Continuity (i.e. absence of barriers to continued participation in long standing activities and interests)
- Compensation (i.e. the ability to meet basic health and social needs despite age-related disabilities)
- Connection (i.e. opportunities to develop and maintain meaningful interpersonal relationships)
- Contribution (i.e. opportunities to participate in and have an impact upon one's social environment
- Challenge (i.e. development of stimulating new activities and interests)

Contributing and including all the above aspects in the best practice manual will help to strengthen the community. This manual will not be helpful in the case of Iowa but will also be applicable as a model solution for aging community. However, I am hoping to eliminate all the problems of gated communities by developing this new practice manual which makes utmost utilization of existing resources and develop livability in an area. This best practice manual will not only create a walkable community, but it will also strengthen social fabric and bring in more vibrancy in the town. Also making contribution to sectors like transportation and accessibility will be a bonus thing for a community to look upon. Ideas mentioned below in terms of transportation and accessibility are concepts that can be applied for the greater good of

community. But these ideas are mostly bound by policies and regulations which require great deal of efforts firstly on paper, followed by passing through the government before its implementation.

This research work is comprehensive guide for small rural communities for upscaling a better life not only for aging communities but entire community. Strategies, recommendations proposed in this manual are cost effective, mobile and flexible. However, timeline of this interventions can be decided by the government based upon the economic resource that the city possess. Major contribution of this manual is in the area of housing as it is one of the important aspects that the planners must deal. Housing is also accessed by all age group which makes it the priority case. The major idea that this manual is getting is at changing the development pattern for greater growth of the town. Ideas to have affordability in housing are also mentioned in this manual. However, these strategies could be of use only if changes in lot sizes, development pattern and adaptation of flexible zoning strategies are made by the town. For current scenario, the rural towns do not even possess full fledge planning staff, so these changes are going to take time. But action to these strategies are required to be implemented as early as possible to facilitate not only the increasing aging population in town but to make the town more vibrant and energetic. The following contribution mentioned in this section relates to specific topics like transportation, accessibility and health care. Besides this, the section also addresses on how this practice manual could serve the communities in the best possible manner. Next few points highlight the importance of this practice manual and who should be the one looking for it.

- The communities that are more rural and depended on neighbouring major cities for their resources should be the one to use this manual. As most of the rural communities lack the staff expertise and time necessary to develop a form-based code on their own and

therefore choose to hire consultants making it more expensive which in turn leads to non-implementation. Also, it is not only about implementing form-based coding, but it is all about improving the liveability of a place that requires time, guidance and resources.

- The communities that are facing sudden hike in old age population should be the one referring to this manual. As this practice manual will help to put in more precise request for funding that the city requires in more accurate ways.
- Communities that are small in population size like below 1000 people and who are expected to grow more exponentially should refer this manual. This will not only help the community to plan in resourceful manner but at the same time also ensures better health and housing in the community. This manual will help to understand the type of development pattern that is more advisable than following the usual sprawling development.

This research paper is not only about giving thorough information on housing and walkability to accommodate the needs of aging population and small rural communities. But considering the future scenario, topics like Healthcare, Accessibility and Transportation are developed in detail under the Appendix table below. This is quite evident that the livability of community depends upon six factors, i.e. Housing, Transportation, Neighborhood, Environment, Health, Engagement and Opportunity. These topics can be developed in detail with multiple perspectives. However, some of the recommendations and strategies are mentioned in the appendix section. Topics of Transportation, Accessibility and Healthcare are provided under the Appendix A, B and C section under the Appendix table below to understand possible strategies to improvise the existing conditions of rural towns. Understanding all these six perspectives to bring a better

change in community is a key for improving the livability of entire community. Also, small changes in the existing infrastructure and system can be very effective solution to address the needs of people in small rural towns.

Thus, I would suggest that ageing in a city or in a place should not be considered as a problem for the community but an opportunity to create better future for the community. As from the above-mentioned constructive suggestions and recommendations we can say that solving problems for ageing population will also help the people of other age group as they will also be benefited from these changes.

Inferences should be taken from towns which have already started countering problem of ageing populations in rural towns of Iowa. Considering the case of Belfast located in Lee county of Iowa where recreation and housing are major needs for seniors. To counter the needs, Belfast has about 3 miles of newly completed walking trails that are accessible to people using wheelchairs or walkers. In addition, the city permits accessory dwelling units as well as renovations to transform a single-family home into a duplex. Although Belfast does not yet have a visitability ordinance, most downtown businesses have ramps to accommodate wheelchairs. The Waldo Community Action Partners Transportation Program provides transportation for seniors, people with disabilities, and low-income individuals, especially for those receiving medical services from Maine Care and the Maine Department of Health and Human Services (Levitt, 2017). This case is good example of how things could be improvised by targeting the issues of ageing population by strong actions and planning strategies/recommendations. However, I recommend taking a holistic approach that addresses ageing through community design, transportation, health and social interaction. Collaborative partnerships and encouraging volunteer participation could be more beneficial to solve the problems faced by ageing population in the small towns.

Besides this, concept of multi-generational living, inclusion of co-housing facilities in the neighborhood can be adopted in the case where there is a large concentration of ageing population. This implementation solves the biggest problem of affordability and social exclusion in a community. Adding density of people per unit area and developing adequate pedestrian infrastructure will make the neighborhoods more walkable, safer, livelier and more accessible as far as facilities are concerned. The addition of a public transit system also provides safe driving environment for ageing population in a community. Apart from this, adopting strategies like phased in retirement, promoting artistic works among elderly, rewarding volunteering/caring people, fiscal stability and affordable cost of housing and healthcare will be appropriate areas to improve life of aging population.

This best practice manual can be a great resource for smaller cities which are facing increasing trend of ageing population. I hope this recommendations and strategies will be helpful for transforming life of ageing population as well as the entire community in general.

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Appendix

Appendix – A. Transportation

A good transit option for the community can solve various problems of the community. Good transit provides:

- Efficient connection to medical care.
- Safer environment than driving.
- A solution to eliminate isolation.
- A safer way to walk.

Transit options like paratransit and micro-transit means could eliminate problems of commuting for ageing population. Paratransit services can be extended to ageing population so that it can turn out to be an efficient mode of commuting. Extension of in-state bus services twice a week from neighboring major city will help in better accessibility and at the same time by not providing or developing an infrastructure for it. Bus service that allow people of Lansing to commute back and forth to nearby major city will provide a mean of public transportation service. Whereas a micro-transit is a type of demand responsive transit (DRT). This technology enabled transit service offers flexible routing and/or flexible scheduling of minibus vehicles. However, the best part is that even micro-transit does not require any kind of infrastructure and installation cost but does solve the problem of commuting in smaller cities. Only thing require here is the dedicated bus stop/transit stop from where people can access these services.

In addition to it, technology can also have greater improvements in access to transportation options. Software applications like on demand services like Uber/Lyft could really help the

ageing population. Technology like autonomous cars or self-driving vehicles could really help people in the smaller cities. Implementation of self-driving vehicles could also be helpful in terms of providing people access to fresh food, vegetables, fruits, medicines at their door steps. Mobile vans in these cases could benefit significantly. Mobile vans could run from nearest major cities and can bring resources to small towns.

Appendix – B. Accessibility

This section of accessibility indicates what different facilities can be improved as far as interventions are concerned. The following figure 1 indicates a dedicated bus stop for the city as I believe it is one of the important needs for the ageing population. Bus gives people a mean of commuting which is risk free and at the same time accountable. However, this is a long-term solution as it involves lot of infrastructure and money for installation.

Figure – 1 *The above illustrations showcases a full fledge bus station in a community.*

Source: Author, 2019

The following figure 2 suggests how addition of a bus stop would be helpful for smaller cities to provide immediate solution to the availability of public transportation option. Buses in the city can run twice a week to popular destinations that the community desire to go. I think addition of a bus stop will be a flexible, adaptive and cost-effective solution to the problem of accessibility.

Figure – 2 *The above illustrations showcases a bus stop on the main street of city and its also highlights the margins and distances from the building in a lot.*

Source: Author, 2019

The next thing that can be countered is to provide accessibility to fresh food especially for this older people. Use of mobile applications to avail online food deliveries, using advanced means of available resources like mobile vans from Walmart or Hy-Vee can be a great resource as well. This can be witnessed in the next figure 3. These services are available in many cities currently, but these facilities could be availed to smaller cities at least twice a week or once a week. Apart

from this, on demand services through mobile applications is one of the quickest ways to get assistance. However, the notion of inability to use technological devices by aging population is one of the barriers. But I believe, with passage of time, the aging population can get better equipped with technology.

Figure – 3 *The above illustrations explains the use of on demand services and mobile applications to assist aging population with access to facilities.*

Source: Author, 2019

Appendix – C. Healthcare

Figure – 4. *The above illustration shows the benefits of providing 24 x 7 services and facilities to provide a helping hand to aging population.*

Source: Author, 2019

The figure 4 presented above illustrates 24 x 7 services as far as medical facilities are concerned. Healthcare is one of the important aspects that needs to be countered especially for the aging population. Assistance to aging population can be made available by volunteering acts or by including students into paid form of internships for the same. However, the concept of multi-generational housing can effectively solve the problem of assisting aging population. An

adequate form of housing can lead to bridge gap between seeking assistance and having assistance for aging population.

In addition to it, the idea is to bring better health facilities to people. This can be achieved by adding more health centers especially for aging population. Also providing public park for aging population where they could socialize, exercise and revive their memories would be a great source to boost a healthy and disease-free lifestyle for aging population.

Figure – 5 *The above illustration presents a view of how a communal space or recreational space for aging population can assist the people to maintain healthy lifestyle.*

Source: Author, 2019

The figure 5 above shows a scenario about how assisting and providing community centers or health centers nearer to people could benefit the aging population to live a healthy and stress-free life. As aging and health are dependent on each other. The diagram 6.6 below from World Health Organization (WHO) guidelines suggests how factors like housing, assistive technologies, transportation options, social facilities, diseases, behavior and age-related changes in physical body is going to impact aging population. However, WHO promotes to make age friendly environment in our surroundings, a change in perception of aging population, developing benefits for long term are and providing better assistance is going to benefit the aging population.

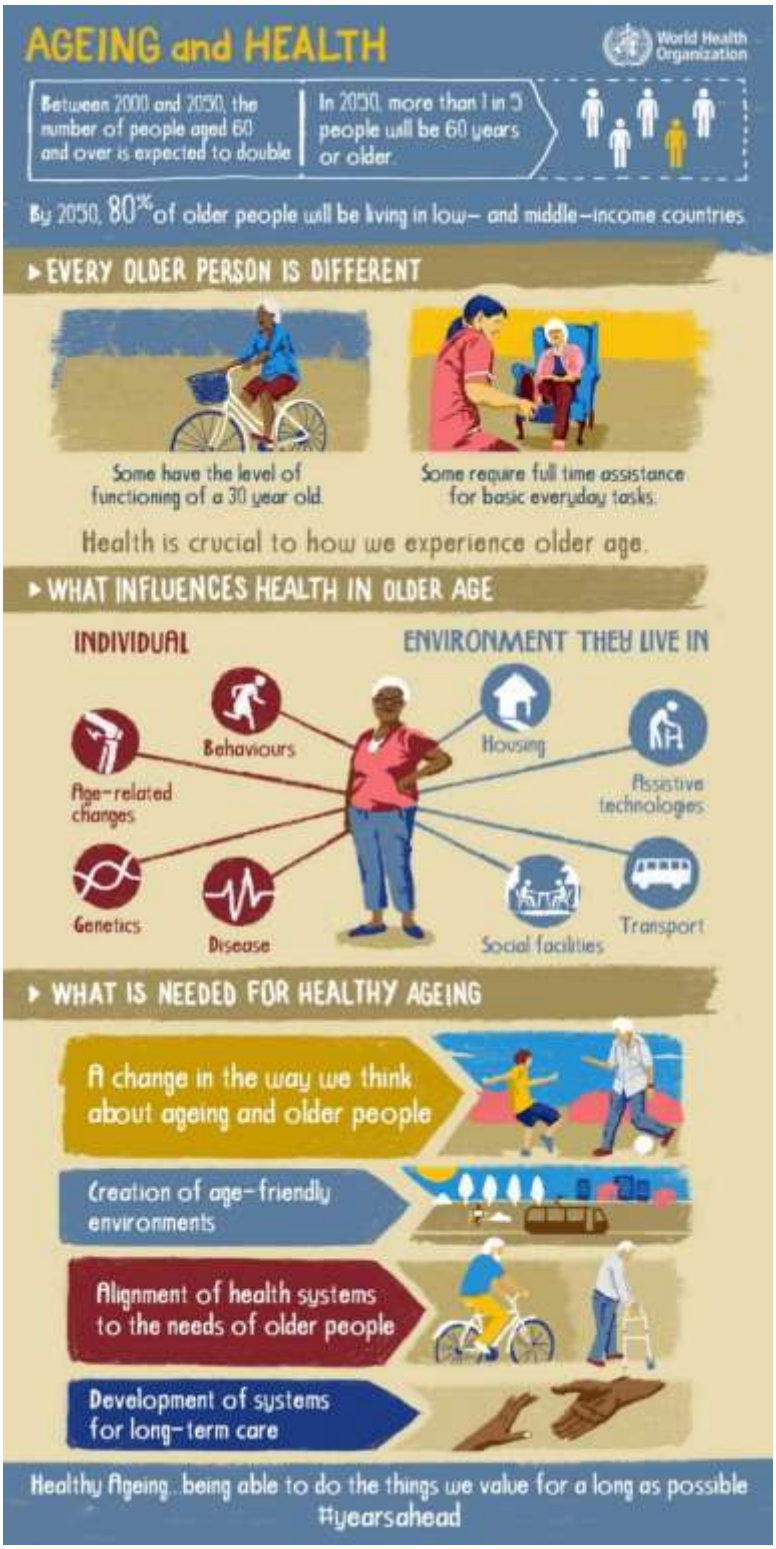

Figure – 6 *The above graphic shows how aging and health are relative and how can we successfully bridge the gap between the two factors to provide benefit to aging population.*

Source: What is Healthy Ageing? (2018, February 08). Retrieved from https://www.who.int/ageing/healthy-ageing/en/

In addition, the figure 6 provides a great understanding of how we can transform the problem of aging population into developing a healthy lifestyle. A healthy lifestyle will not only encourage aging population for active lifestyle but will also help them to stay more flexible, energetic and happy. This could also benefit the aging population by staying longer in the workplace or access part time jobs for volunteering. And these activities in turn solve the problem of social exclusion and create a disease-free environment.